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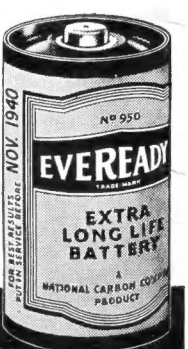

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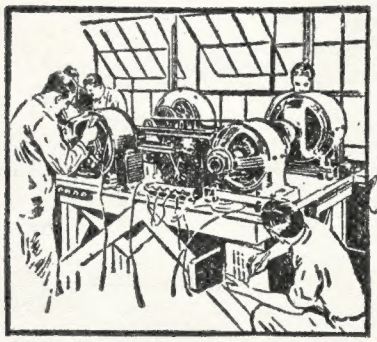

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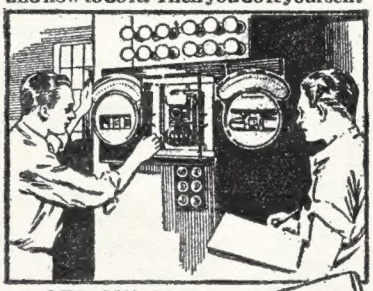

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The cover painting by E. K. Bergey depicts a scene from Oscar J. Friend's short story, THE STOLEN SPECTRUM.

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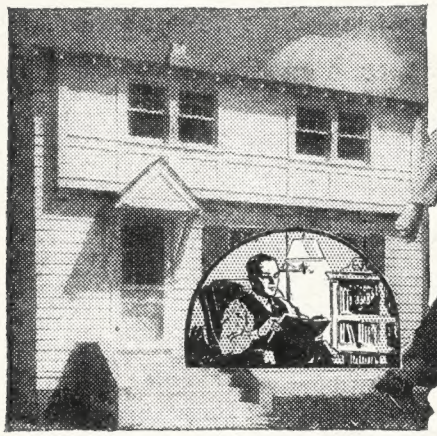

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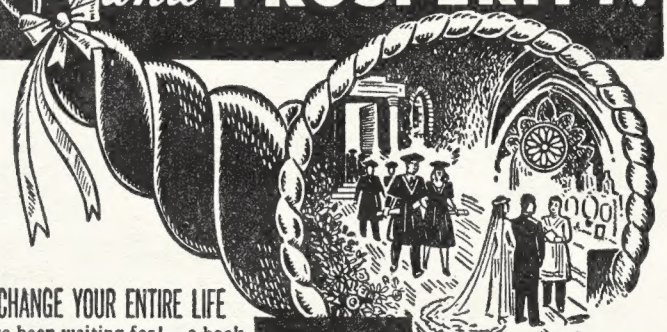

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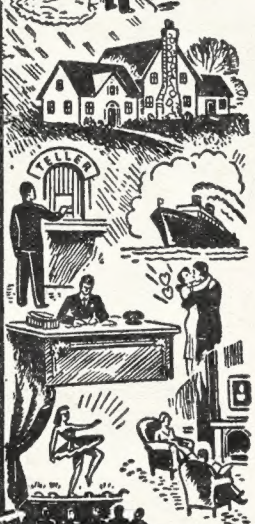

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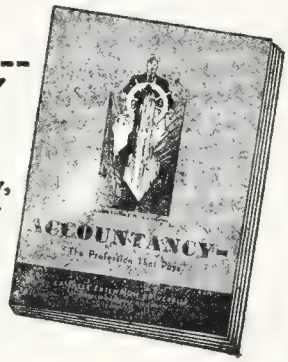

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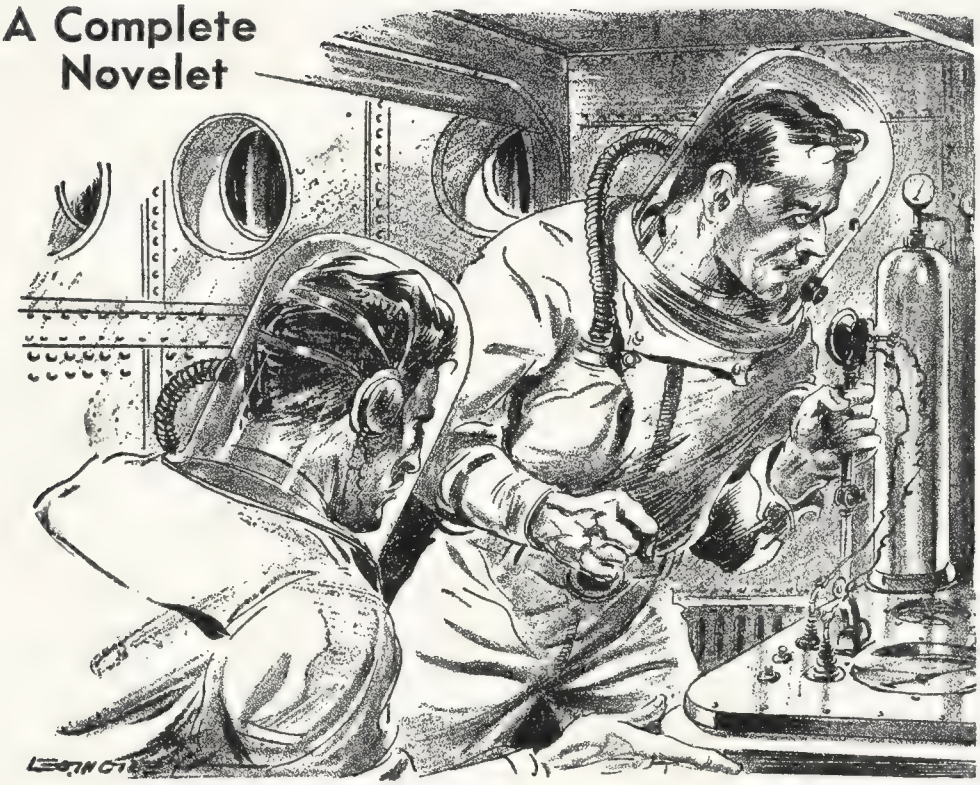

"Look, Greg Zhor!" Karragon laughed harshly. "She shall be

THE TYRANT OF

CHAPTER I

The Price of Failure

GREG ZHOR, lying flat on the rooftop, gazed over the parapet at the crowded streets below. Mercis, mighty capital of Mars, presented a brilliant, grim spectacle. The tall buildings, with their double windows for protection against the red dust storms, were plastered with pictures of Karragon, dictator of Mars. Banners bearing the Thelist symbol, the hated circle-enclosed square, hung limply in the hot, dry air.

High overhead, ominous space cruisers darkened the fierce, white-hot sky. The Gros Canal—recently renamed the Karragon Canal—cut the city like a sharp, silver knife. Its waters were choked with canal-defense boats, the speedy crafts designed to enforce the Thelist rule upon hamlets that were too small to warrant a visit from the huge space cruisers.

The city streets were lined with swaggering Thelist Guards, big, insolent fellows armed with heat guns and shock-sticks. Batteries of heat guns, lumbering rocket-tanks, and rows of trucks rumbled through the city, blackening the streets with the downward blasts of their rockets. All that vast show was the usual prelude to Karragon's fiery, bitter speeches.

On the rooftop, Greg stared with furious eyes at this parade of the dictator's might. Half a decade before Mars had been a republic, quiet, peace-

A Scientist's Strategy Sunders the

yours—in exchange for Mars!"

MARS

By FREDERIC ARNOLD KUMMER, JR.

Author of "Worlds Within Worlds," "Revolt Against Life," etc.

ful. The Rihns, descendants of the aboriginal Martians and the early settlers, lived in perfect harmony with the pure-blooded Terrestrials. Mars had been united then, devoted to scientific progress.

Greg glanced at his copper-skinned, muscular fingers. His brilliant research in the field of atomic energy had brought him fame—until the rise of Karragon.

An obscure mechanic suddenly discovered that his voice could sway crowds. By inciting the Terrestrials to hatred of the Rihns, he gathered about him a following of brutal rowdies, of bigoted fanatics. Now Karragon ruled by force and fear, madly building armaments for his dreams of conquest.

The Rihns, segregated from the pure Terrestrials, were eternally persecuted. Secret police were everywhere. Greg was forced to discontinue his scientific work, made a test-tube cleaner

Shackles of a Crimson World in Bondage!

by the arrogant Thelist physicists. Joan Vail, the pure-blooded Terrestrial girl to whom he was engaged, had been forbidden to see him. Greg's life had turned from the rosy hue of his native Martian planes to the bleak darkness of outer space.

Suddenly, from the streets below, came a thunderous roar.

"Karragon! Karragon!"

The wretched Rihns were aware of the consequences of silence. They echoed the shout, their right hands raised in the Thelist salute.

IN his fantastically ornate car, the dictator looked neither to right nor left. His bullet head gleamed in the sunlight. His jutting jaw was set at a belligerent angle. But now and again he would tug at his small mustache.

In the center of the square the car stopped. Karragon stepped out, climbed to the speaker's dais. Striking a theatrical attitude, he stood smiling at the tumult of applause.

Deliberately Greg Zhor drew out a small ray gun. The dictator had begun to speak. Greg could hear the fiery words, echoing through the amplifying system.

"First, war to liquidate the enemy within. Then, a glorious war to conquer the Solar System! Enemies . . . Victory . . . Triumph . . ."

Sighting along the barrel of the ray projector, Greg laughed. Karragon was boasting of his might, his conquests to be. In another second he would be blasted into ashes! With the people of Mars free, there would be a return to peace and progress. His finger tightened about the trigger.

"Greg!" Light footsteps sounded on the roof behind him.

Greg leaped to his feet, saw a white face framed by dark ringlets, black eyes wide with fear. Then she was clinging to his arm.

"Joan!" he muttered. "What are you—"

"I learned of the plot from old Zoab. Thank God, I arrived in time!"

"To stop me?" He stared at her, incredulous. "You want to stop me after what Karragon has done to my people? After he has ruined our dreams of happiness?"

"But, Greg! It would do no good to kill Karragon! The Thelist machine has the planet in its grip. If Karragon died they would elect another to take his place. Would killing him destroy their fleets, their war machine? Would it disorganize the secret police, or repeal the harsh laws? And think what would happen to your people when it became known that a Rihn had assassinated the dictator!"

Under the force of her words, Greg's shoulders sagged.

"You're right, of course. It would only result in the persecution of my people. There's nothing we can do. Nothing!"

"No, Greg. There's a lot you can do. Set up a secret laboratory and continue your work. Discover something — something big — that will destroy the Thelist forts and ships. You will, Greg. I know you will!"

Greg straightened up. "I'll try, Joan. I'll do all I can for my people—and for you." He crushed her into his arms, kissed her.

Shouts, heavy footsteps drove them apart. A half-dozen Storm Guards poured out on the rooftop.

"By Thael!" their leader roared. "Here's insolence. Bad enough for a Terrestrial girl to be seen talking to a Rihn—but making love! A year in the mills will make you more careful with your kisses, wench. And as for you—" He broke off suddenly, noticing Greg's hand slide toward his pocket. "Watch out! Grab him!"

Storm Guards leaped forward, touched Greg with the copper tips of their staffs. Joan screamed as he writhed under the high voltage, then crumpled limply.

"Let's have a look through this rebel's pockets. By Thael, a gun! The radium mines for you, my friend. That's the penalty for a Rihn carrying a gun." The leader beckoned to one of his men. "Take the girl to Headquarters. The mills for her, and send a stretcher for this traitorous dog."

Greg, dimly conscious, heard Joan's voice calling, repeating his name. From the square below came Karragon's voice, thundering triumphantly.

"Culture and civilization which we will spread throughout the Solar Sys-

tem to form a new and glorious era—Utopia!"

* * * * *

GREG ZHOR remembered little of the next month. He was conscious of only dreamlike impressions. The brief mockery of a trial and the sentence to life imprisonment — two years—in the radium mines of Phobus.

He remembered being carried into the prison ship, landing upon the barren, rocky plain, being herded with hundreds of other prisoners into the glassite air-locks of their underground world. Indelibly stamped upon Greg's mind were the spaceport with its blackened sand pits, its freighters waiting for their cargo of radium ore—the bristling towers and administration building—the repair shops and pumping station—and beyond, the bleak terrain dropping off into a close horizon. Before them the air-lock sloped downward into the heart of the little world.

Guards clad in lead-x suits drove them forward with waves of their shock-sticks. Downward, a maze of galleries and shafts was lit only by sickly green radium lamps. One of the prisoners, a white-haired Rihn, fell to his knees, horrified by the eerie atmosphere.

A burly guard stepped forward, cracking a heavy whip. Greg stood frozen with horror as the lash thudded about the old man's shoulders. He tensed, fists clenched. Then the sight of the other keepers, shock-sticks glowing, made him realize the futility of resistance.

Sick with despair, he turned, trudged forward to escape the sobbing moans of the dying man.

Downward, ever downward.... The huge leaden shoes he wore as compensation for the feeble gravity of Phobus raised blisters on his feet. In spite of the vast air-locks and pumps above, the air was stale, fetid. Deathly cold slashed through his ragged garments.

Suddenly, as they rounded a corner, there came the sound of singing—the plaintive, chilling Song of the Sufferers. The song tormented Greg, tore at his heart. He could shut his eyes and imagine a dusty plain with its clumps of *fayeh* bushes filling the air with fragrance, the lapping of the water in the canals, the restless yelp of a farm-dog. And always the song held that aching, tortured monotony of despair. Then, just as it seemed one could stand no more, the Song of the Sufferers ended. Greg shuddered, stumbled forward into the rock-hewn cell.

"Saints!" Old Zoab clutched at Greg's arm. "Will we be like them after we've been here awhile?"

Greg glanced about the large cavern. It was crowded by the new prisoners, some two hundred in number. Shivering with cold, they huddled around the roaring natural gas flame which kept the prisoners from dying of cold during their rest periods.

A strange lethargy crept over Greg. There was no escape, no hope. Two years at the most, and then radium poisoning brought eternal release. He turned toward the heat.

"Greg," Old Zoab quavered. "Will we be like the others?"

Slowly Greg's eyes came into focus. He was a Rihn, descended from the old race of Mars and the first hardy Terrestrial colonists! Suddenly Joan seemed to be standing before him. He could see her bent over the looms in the great mills at Mercis, so brave, so determined. She had believed in him. Greg Zhor straightened up, jaw set.

"No!" he stated fiercely. "No!"

The clanging of the cell's iron door whipped him around. A brutish guard, ray gun in hand, shoved a box of concentrated food tablets into the cell. Water was to be obtained from the thin stream that poured from a fissure in the rocky walls.

"Divide the tablets equally!" Greg cried. "And rest. You will need sleep."

Sheeplike, they obeyed him. He propped himself against the wall to think.

IN the weird half-light of the mines, there was no night or day. Only eating and exhausted slumber interrupted the heart-breaking toil in the shafts. Horribly distorted by radium poisoning, the older prisoners chanted the Song of the Sufferers.

Outwardly Greg and his group had

taken on the emotionless, robotlike appearance of the others. In the rest periods, however, they sat hunched about the spouting flame to whisper plans of escape. At first they were in favor of rushing the guards during the trip from the gallery to the cell. Greg and old Zoab pointed out the futility of such action. The guards, armed with ray guns, would cut them down without compunction.

"During the time for sleep," Zoab muttered, "there are only two guards patrolling the lower levels."

"And how do we get out of this iron kennel?" a prisoner growled.

"Greg Zhor will think of a way—in time," Zoab said firmly.

"In time!" the man spat disgustedly. "Better a quick death by the heat rays than have our bones rotted by radium poison. What good is science without electricity, without apparatus?"

A chorus of voices murmured. "Bar El is right," someone grunted. "Already the radium takes its toll!"

Greg stepped forward, motioning for silence.

"If I find a way to escape, will you devote your lives to the overthrow of Karragon and the freeing of Mars? I have that way of escape!"

CHAPTER II

The Crushed Can Conquer!

FOR the first time in many months, fierce hope shone in the circle of eyes.

"Follow you?" Bar El whispered hoarsely. "Let me have but one glimpse of the Sun, of the red plains of Mars. I'll follow you to hell and back!"

Greg stared at the eager faces. They counted on him so heavily. What if his experiment proved a failure, or his memory played him false? But he had to escape—for Joan. . . .

"Good," he said, with a confidence he did not feel. "By three more rest periods we shall be ready to escape. I promise it."

"Greg." Zoab touched his arm. "How is it possible? Don't tantalize them with hopes that can not be realized."

"False hopes?" A thin smile crossed Greg's lean, dark face. "How would you go about obtaining an acid, Zoab?"

"Why"—the old man seemed puzzled—"I'd set the gauges of a Henderson Converter to the proper atomic structure and. . . ."

"True." Greg nodded. "But we have no Converter, nor the means of making one. Yet the ancients had none either, and they obtained acids."

"History," Zoab said with a trace of sarcasm. "I'm a scientist."

"So were the ancients." From a niche in the wall of the cell, Greg drew several clumsy jars, gleaming dull red. "I noticed clay stains on the clothes of Mark Victis, who works in gallery forty-four. Each day he has managed to bring back two handfuls of it. I baked these jars over the jet while you others slept."

Zoab stared at the vessels. "I do not understand."

"Look." Greg uncovered one of the jars. It was filled with a greenish crystalline substance. "Melanterite! I found it in the gallery where I work."

"Melanterite? That's mostly iron sulphate."

"Right." Greg placed a long, nozzle-like clay cap on the jar. "We shove the jar into the gas flame and immerse the end of the nozzle into this vat of water. Sulfur trioxide will pour from the nozzle and bubble up through the water, creating sulphuric acid."

"Greg!" Zoab cried. "This—this means—"

Greg Zhor watched the bubbles rising through the water.

"It means a chance for freedom!"

Three rest periods later, all was in readiness. The occupants of cell twelve, trudging back from the galleries, struggled to fight down their excitement. Greg glanced at the guards nervously, fearing that they might sense the air of suppressed activity. The Thelists, however, had no thought for anything but going off duty. After shoving the food tablets into the cells, they left only the two night guards to pace the shadowy corridor. Greg Zhor began to drip the acid into the massive iron lock. He told the others to rest, but sleep was

impossible. Grouped in a circle about the flaring gas jet, they sat frozen into tense immobility. Their eyes were fixed on Greg as he used the clay nozzle to keep the lock wet with acid. Only at the guard's approach did they sprawl on the floor in feigned slumber.

HOURS passed. Old Zoab broke the silence with a whispered question. Greg shook his head, resumed his monotonous task. A thousand fears harassed him. Was the acid too dilute? Had he been correct in his calculations? How much time still remained?

Bar El had been counting the number of times that the guard passed the cell. Now he stepped forward.

"The period has almost passed. Can't we continue tomorrow?"

"No. They would see the lock had been tampered with."

The voice of a guard calling to his companion echoed along the corridor.

"By Thael, I'm tired! The last five minutes seem like a year."

"You hear?" Bar El whispered. "Too late!"

Greg's shoulders sagged. Their one chance — and it had failed! He examined the lock. The metal, though eaten deeply by the acid, still held. When the guards opened the cell to take them to the shafts, it would be discovered. . . .

"Wait!" Zoab gripped his arm. "The lock is more than half gone! Throw your weight on the door!"

With a furious cry the prisoners hurled themselves at the iron grating. It shook but did not yield. The two sleepy guards spun around, fumbling for their heat guns.

"Once more!" Zoab cried. "Now!"

In a mad, desperate burst of energy, the Rihns crashed against the door. A sharp crack, and the weakened lock gave way. The prisoners poured into the corridor, an avenging wave of humanity.

The guards' heat guns spurted flame, cutting wide swaths in the maddened mob. The prisoners threw their heavy, leaden gravity shoes. The guards, trying in vain to dodge, were literally buried beneath the massive chunks of lead.

Greg leaped forward, snatched up one of the heat guns. In an incredibly short time the locks of the other cells had been melted. A crowd of bewildered prisoners stumbled into the corridor.

"This way!" he shouted, racing along the passageway to the surface. "Quickly!"

Blindly they followed him, running at top speed along the rocky gallery. Greg had confused impressions of distorted shadows, stentorian breathing, the patter of myriad feet. Upward, always upward. The blood pounded in his temples. His breath came in gasps.

As the fugitives rounded a corner of the passage, they suddenly halted. Not a hundred yards ahead of them was the day shift of guards, thirty of them, armed with heavy atomite rifles.

Greg raised his ray gun. Before he could fire, a blast from the rifles dropped at least three hundred of the Rihns. Greg felt a hot, searing pain along his arm. He slid instinctively to the floor beside the charred, blackened corpses of his comrades.

The remainder of the prisoners backed hastily behind the protecting angle of rock. Greg, lying motionless, watched the group of guards advance slowly, their rifles poised. One of them was adjusting his micro-wave set. If a general alarm reached the surface—

GREG raised the heat gun. A blue ball of fire from an atomite struck the wall of the cavern directly over his head. He winced as a drop of molten rock struck his shoulders. Then he squeezed the trigger. A despairing scream, a puff of smoke and the guards dropped lifeless to the floor.

"Good lad," Zoab hobbled around the corner, clutching a scorched leg. "What fools, to stay in close order!"

"Hurry!" Greg leaped forward. "The alarm may have reached the surface."

Once again the Rihns surged forward, stopping only to pick up the atomite rifles. The ascent was slower then before, since some of the wounded had to be carried. Pale light gleamed ahead. "The Sun!" Zoab cried hoarsely. The sight of it made Greg forget the pain in his arm. Now

they were in the great glassite tube leading to the spaceport. High above, Mars loomed vast and red in the sky, bathing the icy surface of Phobus in pale rose light.

So far, it seemed, no alarm had reached the little surface colony. The pumping station, the spaceport, the fortress, showed no signs of unusual activity. At the entrance to the air-lock a bewildered guard spun around. A blast from an atomite rifle cut him down before he could shout a warning.

Greg glanced ahead and his heart sank. There was only one space ship in the port. Instead of lying beside the air-lock, it rested fully a quarter of a mile away. How were they to reach it without space-suits?

"The alarm!" Bar El cried as a warning scream echoed through the tube.

"Take off your gravity shoes!" Greg snapped, pulling the release lever that opened the inner door of the air-lock.

They obeyed. He reached for the second lever.

"Hold your breath!"

The outer door swung open. Escaping air roared from the tube into the surrounding void, swept the prisoners half the distance to the ship. Free of the heavy lead gravity shoes, they were able to cover the remaining distance in a single mighty leap.

Eager hands reached up to tear open the door. The outer door was drawn shut, the inner opened. The fugitives poured into the ship, gulping the life-giving air.

"The engines, Zoab!" Greg cried, running along the companionway toward the control room.

Beneath Mark Victis' pale, radium-rotted face one would not have recognized the bronzed young pilot who, a year before, had commanded a liner on the Jovian run. He stepped forward, glanced at the banks of instruments.

"Should have more pressure for the initial blast," he muttered. "But maybe with the low gravity—"

A blinding flash of light shot from the ramparts of the fortress. Greg felt a wave of fierce heat. The sand beside the ship melted and ran.

"Big guns," he cried, diving for the rocket release.

The rusty old freighter shuddered, leaped skyward. Victis, at the T-bar, grinned in exultation. He spun the controls to place the thickness of the tiny satellite between the fort and the ship.

"That ought to do the trick," he chuckled. "And when they find all their air escaping through the open air-lock, they'll lose interest in us." He glanced at the three-dimensional map of the Solar System. "Where to, Chief?"

"The asteroids!"

OLD ZOAB looked like an undernourished Santa Claus as he stood before the port-hole, stroking his white beard. But there was no joviality in his blue eyes. They were anxious, alarmed.

"The asteroids."

A maze of bright spots ahead, diamond dust, stippled the velvet sky.

Greg nodded, a tight smile on his lean face.

"We're under their gravitational influence now. I shut the motors off an hour ago."

"Not much fuel to save. This old tub was used only for the run between Mars and Phobus. Even with the emergency tanks we'll be lucky to avoid a crash when we try to land."

"We've come this far by doing the impossible," Greg said. "We've escaped from the mines, eluded Karragon's space fleet. Nothing's going to stop us now. This supply ship is loaded with food capsules. If we can find some secluded little world and buckle down to work on that re-creation theory—"

He broke off as Victis' voice echoed through the communication system.

"Greg, come up to the control room at once. Hurry!"

Greg ran along the corridor toward the control room, followed by Zoab. Bar El and Victis were staring through the observation port directly below.

"Look!" Bar El ordered. Below the ship was a round, glittering sphere, a tiny asteroid not much bigger than Phobus.

"Drifting without motors enabled its gravitational field to attract us," Victis said. "Spectroscopic observa-

tions show no atmosphere and a surface composed mainly of magnesium oxide. To avoid this little world would take all of our remaining fuel. We would be unable to land on any other asteroid."

"So we have no choice but to land here?"

"Right."

Zoab's gnarled hands worked convulsively. "A barren world without air or water. I am old and death does not matter. But you, Greg, with such great ideas to give to humanity! And those poor lads below, happy over their escape." The old man bowed his head.

"Nearly time to cut the rockets," Greg said unemotionally. "Bar El, tell the others we are going to land."

CHAPTER III

Death and Rebirth

THE pallid plain rushed up to meet them. At a thousand feet Victis snapped on the forward rockets. Greg watched the roaring jets of flame churn up the magnesium oxide, blacken it. The ship sank easily toward the ground.

Abruptly the rocket blasts fizzled away to a feeble sputter. Greg had only time to press the general alarm button before the sickening crash.

He climbed dazedly to his feet. Victis was sitting on the floor, caressing a lump on his head. Zoab, clinging helplessly to the rocket acceleration handle, stared helplessly about.

"Fuel was lower than I thought," Victis grunted, snapping on the communication set. "All right below?"

"Only minor injuries," a voice replied. "But the stern plates have buckled. Our air-purifying system is completely wrecked. And our air supply is leaking out!"

"Isolate the rear compartments," Greg snapped. "Close all bulkheads."

The main cargo hold was strangely silent as Greg and his companions entered. The refugees stood grouped about the freight lift. The weeks of flight in the space ship had wrought miracles in their appearance. Rest, food, and treatment for the terrible radium poisoning had given the ragged prisoners new strength, new life. They grinned a greeting at Greg.

"Not much I can say," Greg stated. "Too bad things have to end like this when we were so close to escape."

"End?" a man retorted. "We've air enough here for eight hours. That white world outside may contain . . . well, anything."

"How about an exploring party?" Victis asked.

"Why not?" Bar El rumbled. "One man in a space-suit. There're only ten suits aboard. Give me one of them and I'll have a look."

Victis shook his head. "Not you. Let Zhor go. He's the scientist. He'll recognize valuable elements if he sees them. Perhaps something to make air —or fuel for the rockets."

Greg straightened his shoulders. It was futile to talk of making air, but he could not quit. Besides, who could tell what this strange little world might contain? With a nod to his companions he slid his lean, muscular frame into the heavy space-suit, stepped through the air-lock. White, level plains of magnesium oxide stretched on all sides to the close horizon. As he stepped from the shadow of the ship, he found the sun's rays mildly warming. His feet sank deeply into the loose dust. Clouds of it, stirred up by his long stride, fell slowly under the light pull of the asteroid's gravity. With one backward glance at the wrecked freighter, he set off across the plain.

He had not been gone three-quarters of an hour before he found himself completely lost. The unvarying expanse of white dust was entirely without landmarks, and the close horizon made it impossible to see the stranded ship from a distance. He thought of back-tracking along his own footprints. The fine soil had settled levelly into place.

As the short day merged into night, Greg's overwrought nerves cracked. Sense of direction completely gone, he ran in circles, panting, frightened. Always he saw the same monotonous vista of level white.

Within a few short hours the night turned into day. Delirium gripped the young scientist. His mouth was dry, parched. Joan, slim and lovely, danced in front of him, holding cups of limpid water before his feverish eyes. Karragon, mocking, gripped a white-hot lash in his hairy hand.

Greg screamed, filling the helmet with noise. A dozen times he thought he saw the wrecked freighter. The oxygen tank on his shoulders was almost empty. And the others on the ship—were they alive? Had they given up hope of his return?

Suddenly there appeared distorted faces. Wretched Rihns, ground under the Thelist rule, begging for help. Joan—Karragon—oxygen.

Greg stumbled forward through the white dust. There was the ship, and his companions, without space-suits, standing about the stern. Another mirage. He groaned and everything went black.

WHEN Greg came to, he was lying face downward on the white dust. His head, free of his helmet, was hanging over a rocky fissure. Greg took a deep breath. Air, heavy, but cool and life-giving. . . .

"Ah!" Zoab's voice seemed miles away. "Good lad. I was afraid."

Greg shook himself, climbed dizzily to his knees.

"Careful," Victis warned. "Not too far from the edge of the crack. The air expands quickly."

Greg looked about. They were under the crumpled stern of the space ship. From within it came the faint sound of hammers ringing on metal.

"I don't understand. The mirages —and I fainted."

Zoab tugged at his beard, smiling.

"Luck," he said. "Pure luck. We might have died in the ship for lack of air while this natural well lay outside. While you were gone, Victis and I decided to put on suits and take a quick look at the damage. We thought we might be able to make repairs. As we passed this spot, I noticed dust rising in little puffs as though something below were pushing it up. Victis and I scooped away the oxide and discovered this crack in the underlying rock. It's not the type of air to which we have been accustomed, of course. But it contains sufficient oxygen for human life. There must be a pocket of it below us, like natural gas wells on the planet Earth. The impact of our crash opened it. We should also be able to condense moisture from it."

"The others are fixing the old air tanks to enable us to pipe air into the ship," Victis said. "Zoab and I were just going out to look for you when we saw you stumbling toward us. Find anything?"

Greg nodded, leaned forward to let the cool air fan his cheeks.

"Reprieve," he declared.

A new spirit gripped the little group of castaways. The fissure gave ample air. Zoab, true to his prediction, was able to condense water from it. As for food, the cargo of concentrated tablets would last them a year or more. They were able to live, but any accomplishment was checked by a lack of power.

The irony of the situation appalled Zoab. For months they had worked in the mines, surrounded by radium. Now, for lack of a single gram of the substance to power their motors, they were marooned on this bleak asteroid. Eventually their food would be exhausted—

HOPE, however, was not abandoned. The long range audiovisor was repaired. Some undiscovered source of energy might enable them to contact friendly powers on Earth, who might be induced to brave Karragon's wrath by rescuing them. Exploring parties laboriously sank shafts into the rocky substrata, seeking something—anything—that might be used to generate power.

Zoab and Bar El worked tirelessly to find some means of utilizing the ammunition for the ray and atomite guns to run the audiovisor. Victis tinkered with a model solar energy unit. The little asteroid's swift revolutions, from day's warmth to night's biting cold, made his efforts useless.

During these long months Greg Zhor remained in his cabin, laboring over masses of paper. Those half-formed plans which had constantly

crossed his mind while in prison were taking shape on paper.

Re-creation—in the beginning, a weapon to defeat Karragon. In the end—who could say? Its variations were endless. Re-creation was merely the reverse of a process which is old as time.

Greg picked up his pencil, plunged once more into the maze of intricate calculations. Zoab entered the cabin noiselessly.

"I have brought you food."

"Food? Ah, yes. You have brought me food many times during these long months, haven't you, Zoab? And talked to me, too, although I'm afraid I haven't listened. But today, old friend, I shall listen. It is finished. Another hour or so of detail, perhaps, and re-creation is no longer a dream. It is here, a reality, waiting only to be transformed into metal. How are the others?"

"We are all well," the old man replied. "But—"

"Good." Greg stood up, smiling. "We have a big job ahead, building the re-creator. You have discovered some source of power, of course. I shall need tremendous energy to supply the spectro-tubes."

For a long moment Zoab did not answer. Then, silently, he shook his head.

Greg's face went white. He clutched the edge of the table, stared at Zoab.

"No power? Solar energy, radium, even such primitive sources as coal or oil?"

"Nothing. Magnesium oxide and rock, nothing more. We have used the rifles and heat rays to sink a shaft down thousands of feet but—only rock."

Greg gazed at the mass of papers on the desk. All the life, the vitality seemed drained out of him. He laughed bitterly.

"The greatest invention of the Universe, never to leave this barren mass of rock! All my efforts, hopes. . . ."

He fell back into the chair, buried his face in his hands. Zoab laid a kindly hand upon his shoulder.

"They're still digging," he said. "Perhaps, deeper—"

A clanging of feet in the iron corridor interrupted him. Bar El, his face covered with an air mask, burst into the room.

"Explosion in the shaft! Hensic was killed!"

GREG and Zoab ran into the control room, peered through the observation port. A short distance from the bow of the freighter were the great piles of rubble which had been taken from the shaft. A hundred figures stood beside the ship, staring in awed wonder.

A vast blue column towered high above the shaft. The blue color, Greg noticed, was more pronounced at the base of the column, growing fainter and fainter until it disappeared entirely at the top.

"What is it?" Zoab whispered.

"I don't know," Bar El growled. "We were digging at the bottom of the shaft. Suddenly there was a rumble and this blue stuff shot us out of the pit and into the air. Hensic must've scraped against the wall of the shaft while we were being hurled upward. He was ripped to shreds. I was tossed up as high as the top of the geyser but the light gravity and the soft magnesium dust broke my fall. Damn near froze, though." He shivered, blew upon his fingers.

"Froze?" Zoab exclaimed, his voice shrill with excitement. "It must be liquid air! That accounts for the blue color and the fact that it disappears instead of falling back to the ground. The air from that fissure must be from the same source, only in seeping upward slowly, it has time to vaporize. When this asteroid was in a formative state, centrifugal force hurled the molten rock to the surface. It cooled and contracted, subjecting the air to tremendous pressure. A most interesting phenomenon."

"Interesting?" Greg whirled about, his eyes blazing. "It's p o w e r ! *Power!*"

The days that followed were an endless struggle with crude tools and the rapidly diminishing power of the heat rays. The rocket recoil block, a vast piece of ferro-carbon, was taken from the wrecked stern of the freighter.

Aided by the light gravitational pull, they were able to drag it over the mouth of the shaft, effectively capping the gusher of liquid air. The empty fuel tanks, set up nearby, were converted into huge turbines. Under Greg's skilful direction, a large generator was built.

Swiftly the old freighter dwindled as the power plant grew. The resourceful genius of Zoab created transformers from the remains of the air-conditioning unit, and even serviceable storage batteries from odds and ends of the lighting system. Crude methods, forgotten for centuries, were utilized by Greg in his plans for the creation of power.

At last, after weeks of unremitting toil, the power plant was completed. A pipe, running through the center of the rocket recoil block, led to the turbines, while a series of cogs were arranged to turn the generator at a high rate of speed.

Greg, after a last-minute inspection, signaled Victis to begin the trial. The ex-pilot opened a release valve and a stream of air hissed into the turbines, turning them slightly. Greg bent forward, frowning. As the vaporized air passed off, liquid air shot into the turbines, expanding rapidly under the Sun-warmed metal. Wheels turned, faster and faster, until the great dynamos hummed.

"Greg!" Zoab shouted. "We've done it! We have power!"

CHAPTER IV

Power of the Weak

NOW that a source of electrical energy was assured, Greg threw himself into the construction of the re-creator. This was work of a different nature from the job just completed. Delicacy, the skill of a watchmaker, were necessary to assemble the fragile machine.

This shocked the others. They had expected huge columns, fantastic wheels, hissing pistons—something awe-inspiring, to justify Greg's predictions of its astounding powers.

But the machine was built in two separate parts, both connected with the power plant by high-tension wires. One unit, the selector, consisted of a large keyboard with nearly a hundred keys. Behind this control panel were banks of tubes made of glassite taken from the observation ports.

At each end of the set, tall condensers, capped by copper balls, pointed skyward. From the center of the unit, a thin copper rod arose. Surmounted by a glistening helix, at the touch of a control, it swung in any direction desired by the operator. Beneath the keyboard of the selector was a maze of wires enclosed by non-conductive crystaloid screens.

The second unit of the re-creator, the power projector, was almost a duplicate of the selector. The one difference was that instead of keys it held only a series of dials and gauges.

As the two units took shape, Greg lived an agony of suspense. What if his calculations were incorrect? Suppose the roughly made parts refused to function with the precision so necessary to success? And lacking platinum, he had been forced to make the atomic shield of lead. . . .

At one point in the work, the whole machine seemed doomed to failure for want of enough gold to make the hair-like filament of the spectro-tube. Bar El's wide grin, however, revealed a gold molar that was more than enough to meet the requirements.

Using Greg's plans, the men toiled blindly over the tiny machinery without the slightest knowledge of their use. Accustomed to rough physical labor, they found this almost microscopic work maddening. Time and again Greg was forced to halt the assembly of the machines to return some little piece to its maker for more accurate fitting.

Months elapsed before the two units were finally completed.

Old Zoab threw down his file, straightened up.

"Here's the last connection, Greg. Now maybe you'll give us some idea of what this is all about."

Greg slipped the bit of crystaloid into place, tightened a screw.

"Right. The fact that the Sun is

losing weight at a rate of a quarter-billion tons per minute in the form of radiated photons indicates that energy has mass. This mass, however, is very small. For instance, the energy used by a man in a lifetime of toil has a mass of only a sixty-thousandth part of an ounce. If one were to attempt the conversion of energy into matter, the amounts obtained would be infinitesimal in comparison to the energy used. Obviously the energy released by the breakdown of a single atom would be sufficient to create only one similar atom, discounting any frictional losses."

Greg touched a switch on the projector unit, watched the tubes glow.

"Since matter is the most compact form of energy, we use matter as a source of power." He opened a glassite door in the projector, placed within it a lump of rock as large as his fist. "A blast of electricity passes through lead-x screens. That starts the breakdown of the protons and electrons of the rock into photons of pure energy."

HE touched a button and a blue spark leaped between the two condensers. At once a ray of pale light shot from the small end of the helix and the piece of rock began to dwindle in size.

"The ray coming from the helix is a beam of photons—energy. Their wave-length is twenty-eight octaves higher than ultra-violet light and they are capable of passing through several yards of lead. In spite of this, they are harmless, like the Sun's rays."

Greg thrust his hand into the ray of light, withdrew it unharmed. He walked over to the other unit of the re-creator.

"This is the selector. It requires only a small voltage from the turbines. Each key represents an element. The one I am pressing is marked Au, or gold."

The others watched with breathless interest. A beam of greenish light shot from the helix atop the selector.

"So far you have seen nothing out of the ordinary. Perhaps some of you have witnessed the breakdown of matter into uncontrollable energy in the laboratories at Mercis. That energy can't be made to turn wheels or propel ships. The beam of the selector is equally innocuous. But watch!"

He swung the helix of the selector until it intersected the ray of photons. At the point of meeting both beams ceased. An aura of rosy light sprang into being. Suddenly, in the center of the glow, a small dark object appeared, growing larger with each moment. The piece of rock in the projector disappeared and the energy beam died away. Greg snapped off the selector ray, pointed to the spot on the floor where the two beams had crossed. There, bright against the dull steel, lay a gleaming lump of gold!

Zoab ran forward to examine the glittering bit of metal.

"It . . . it's incredible! Atomic energy released, re-created into any element desired. No more laboring in mines for radium, no more combing the Solar System for *ixite*. This is the re-creation of human happiness!"

Bar El stepped forward, his face

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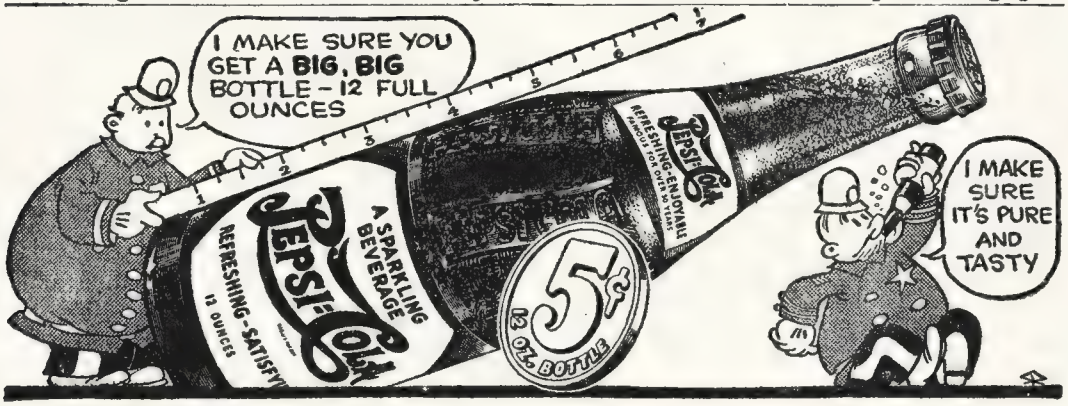


twisted in a puzzled frown.

"A splendid invention, yes. But how will it help us overcome Karragon, free our people?"

"You'll see." Greg turned to the audiovisor screen, spun the dials. "Asteroids calling Karragon, Dictator of Mars! Calling Karragon, Dictator of Mars!"

A moment later a man's face appeared on the screen, a thin, vapid face with a scraggly mustache in weak imitation of the dictator's.

"Central switchboard at Ducal Palace of Mars," he announced superciliously. "What is your message for his Excellency?"

"It's for Karragon alone to hear," Greg snapped. "Tell him that Greg Zhor, leader of the escaped Phobian miners, wishes to speak to him."

"What?" the man gasped. "Wait!" He turned aside, spoke deferentially into a communication tube. When he faced the screen once more, his expression was grave. "His Excellency will speak to you. Keep your dial setting unchanged."

The fugitives saw the man reach for the relay switch, then fade out. On the screen appeared the ancient throne of Mars, glittering with *thorene,* with luminous *ixite.* Seated upon it was Karragon, gnawing at his mustache, gripping the age-old Martial scepter like a mace. His shaven head glistened in the brilliant illumination. His face was convulsed with rage.

"So," he growled. "You have decided at last to throw yourselves upon my mercy—"

"Mercy?" Greg snorted. "We are already familiar with your mercy." Mockingly he gave his exact position to the last decimal. "Come and take us, Butcher—if you dare!"

"By Thael!" Karragon surged upright, his eyes blazing. "Ho, Beltan, Persis! Contact Cruiser Squadron Twenty-three. Kill on sight—"

Greg shut off the audiovisor.

"You will soon have an opportunity, Bar El, to see what our re-creator can do," he said grimly. "Come, Zoab, we have work ahead."

It was a week before the three space cruisers appeared, tiny dots against the dark sky. Greg watching the flare of their rocket blasts, smiled narrowly.

"Take up your positions. At once!"

Hastily donning space-suits and oxygen masks, the band of Rihns abandoned the stripped freighter and crossed the white plain. Some hundred yards from the ship, Bar El and Victis were putting the finishing touches on the place of concealment which Greg had planned. This was no more than a shallow pit large enough to contain the entire party and the two units of the re-creator. It was covered by a large metal bulkhead from the ship, which in turn was thickly covered with magnesium oxide. The wires, running from the turbines to the pit, were likewise concealed.

WHEN the men entered and the white trap-door was shut, only the tiny periscopic tube projected an inch or so above the plain. His eye to the view-plate, Greg watched the Thelist cruisers swoop down upon the little asteroid. "You are sure your rays can penetrate the metal covering of this pit?" Zoab demanded.

"Through a hundred such coverings," Greg replied confidently. "Now remember, Zoab, wait until they land. We must have the ships intact." He touched a small metal box from which wires led to each of the two units. "With this automatic angle control I will be able to handle both selector and projector, synchronizing their movement so that the beams intersect at the exact point desired."

He picked up a lump of lead a foot square, placed it in the projector. Bar El shook his head incredulously.

"That little lump of lead is to destroy a space ship?" he grunted. "How?"

"You'll see," Greg glanced at the view-plate of the periscope, turned excitedly. "They're landing!"

As lightly as a leaf, the first cruiser had dropped to the surface of the asteroid. Greg tugged at a lever, adjusted delicate dials. Suddenly the machines blazed with light, and the piece of lead dwindled like ice on a hot stove. In the blinding sunlight outside, the twin rays of the re-creator were invisible. There was no sign of life from the first cruiser.

Greg placed another lump of lead in

the projector, watched the second space ship settled down on its column of rocket blasts. As he adjusted his dials, he saw the great heat guns of the ship being cleared for action. Sound amplifiers appeared on the control deck. A voice, faint in the thin air, echoed across the plain.

"Fugitives from Phobus, you are at our mercy! We give you thirty seconds to come out of your ship and surrender. If you are—" With a gasping moan, the voice trailed off into silence.

"More lead, quickly!"

Greg reset the dials. Bar El, his eyes wide with wonder, placed another cake of lead in the projector.

The third cruiser had landed beside its silent sister ships. It exhibited signs of sudden panic. Dazzling heat rays lashed out from its bow, focused on the wrecked freighter. The old vessel turned cherry-red, fell apart like a cardboard box in water. Just as the metal started to melt, the rays of the cruiser winked out.

"Finis!" Greg whispered, closing the main switch. "Lucky they didn't ray the turbines before the ship."

"You . . . you mean they're all dead?" Victis demanded.

"Come and see," Greg said somberly.

THEY followed him from the dugout, across the dusty plain. Ahead of them three space ships lay devoid of life.

"Tombs," Zoab muttered. "Giant tombs."

The ground beneath their feet was still hot from the blasts of the cruiser's rockets. Greg stepped up to the first of the great gleaming cylinders, opened the thick outer door of the air-lock.

"Keep your space-suits on," he warned, entering the compartment.

The light inner door of the air-lock was barred, but yielded easily to a blast from the heat ray. Greg kicked open the red-hot door, entered. Through a cloud of opaque greenish vapor, the Rihns could see the bodies of the crew lying upon the floor. Their blackened faces were contorted in agony, their hands clutching at their throats.

"God!" Bar El gasped, horror-struck. "What—"

"An ancient weapon," Greg replied. "One thought to be outmoded centuries ago. Fluorine gas."

"Gas?" Bar El still did not understand. "That little lump of lead?"

Greg nodded. "Broken into energy and re-created in the interior of this ship as gas. Gas equal in weight to that little lump of lead is enough to asphyxiate a city. The three cruisers are ours—intact."

With the capture of the enemy warships, another period of work awaited the refugees. Each of the vessels had to be outfitted with re-creators, prepared for the attack on Mars. The splendid equipment they contained made this far easier than the building of the first set. Greg directed the work in a fever of excitement.

They had come so far since they had escaped the radium mines with only courage and knowledge to aid them. Now, after countless disappointments, endless labors, they had three magnificent space cruisers, fueled with tons of radium. Three ships against Karragon's mighty armada, yet with the re-creator. . . .

Greg thought of his people, the Rihns, wretched, despised, cruelly enslaved. And Joan—Joan whose hair was a cloud of darkness, whose eyes were pools of night. His hand shook at the memory of her. Had the toil in the mills at Mercis robbed her of that dark, vivid beauty? Had she clung to her faith in him in spite of everything? He spurred himself on to redoubled efforts, working until he seemed to be living a strange, distorted dream through which his companions moved like grey ghosts.

In two weeks the ships were armed with re-creation units. Greg took command of one, Victis another, and Zoab, the third.

As they climbed aboard, Greg cast a last look at the little world which had for so many months been their home. The pallid plain, the fused remains of the wrecked freighter, the massive air turbines. Struck by a sudden thought, Greg picked up an atomite rifle, leveled it at the block of ferro-carbon which capped the gusher of liquid air. A dazzling ball of fire

split the heavy block and once again the blue column jetted skyward.

Bar El, squeezing his massive bulk through the air-lock door, nodded in approval. An atmosphere meant moisture, rain. Perhaps some day when the magnesium had been swept into crevices, the rock beneath might rot into rich soil. . . .

In the control room Greg took a deep breath, pulled the rocket acceleration lever toward him. A moment later the three ships were hurtling through the void toward Mars.

CHAPTER V

All for Freedom!

WHEN they were still millions of miles away from Mars, Greg saw the Martian fleet streaking toward him. Half an hour and he would be within range of their heat guns.

He made rapid calculations, pressed the key of the selector marked H. From the nose of the cruiser twin rays shot forth, to be followed a moment later by rays from his other two ships. As the Thelist fleet drew near, it presented easier targets. Since the speed of its approach was constant, Greg found it easy to contract the angle of the twin beams so they met at the correct point. Although the Rihn gun crews were kept busy supplying the hungry re-creators with blocks of radium, the Martian armada seemed to disregard their efforts.

"Huh?" Bar El frowned at the approaching fleet. "D'you suppose we've gassed them all and the ships continue with locked controls?"

As if in answer to his query, a light glowed on the audiovisor. Greg spun the dials. A fat, cruel face, encased in a glassite space helmet, appeared on the screen.

"Greg Zhor." The man's voice was muffled by his helmet. "The commander of our squadron, which you captured, gasped one word into the audiovisor when he died. 'Gas!' We come prepared in our space-suits. Our pressure indicators show that you have in some way released gas in these ships, but we are unharmed. Within five minutes you will be in range of our heat rays. Surrender, or we blast you from the skies!"

Greg turned contemptuously from the screen.

"Shut off that fool, Bar El," he snapped. "Signal Zoab and Victis to proceed according to instructions."

Bending over the keyboard of the selector, he pressed the key marked Pt. All at once the leading ship of the enemy fleet seemed to stagger. With a blast of yellow flame it burst into a thousand fragments! Greg shifted the rays to another ship. It, too, was rent by a mighty explosion.

Zoab and Victis were in action now, and the darkness of space was lit by flaring, shattering explosions. In spite of the terrible havoc, the remaining Thelist ships plunged forward with appalling bravery. Their heat rays licked out at extreme range. Before they could do more than fuse a few outer plates, the mighty unknown force tore them into twisted scraps of metal. In ten short minutes the vaunted Martian fleet, pride of the war-lord Karragon, had been ripped to bits! Bar El stared out of the observation port, awe-struck.

"Greg!" he whispered. "How—"

Greg spun the rocket control to avoid the crumpled hulk of a once-powerful cruiser.

"Gas. I created hydrogen in the ships and the gas, of course, mingled with the oxygen already present. Then I pressed the key which causes the photons to reform in the structure of platinum. A bit of platinum no larger than a marble was sufficient. Its surface absorbs hydrogen. Acting as a catalyst, it brings about a union of the two gases. That union blasted open the ships."

Greg turned to the audiovisor, tuned it to general broadcasting wavelength.

"Escaped Phobian miners calling the Rihns of Mars! We have this day destroyed the Thelist fleet and are proceeding at once to Mars. After five years of persecution and tyranny, a new era of peace and liberty is dawning. Now is the time to strike. Men of Mars, join us in our battle."

BENEATH the space ships, Mars lay like a vast pomegranate, filling the entire sky. Now they were past Deimos with its gay winter sports resorts, past hated Phobus.

"Ah," Bar El rumbled. "I can almost smell the *fayeh* blossoms, hear the water gurgling through the canals. Home, lad! The little taverns with their bottles of sparkling *teka*, their fire-eyed dancing girls. Have you seen them dance within a circle of scarred, space-bitten faces? The jostling of crowds, the clamoring voices, the dry, dusty smell of the air!" He gripped the T-bar tightly. "Mercis!"

Greg, standing motionless beside him, was also thinking of home. To him it meant Joan. It was so long since he had seen her. Now only the land forces of Karragon prevented him from being with her. But those land forces might prove the most formidable of all the barriers he had so far encountered. The great ray batteries, the rumbling tanks, the massive forts. . . .

As the ships drew nearer the surface, the returning Rihns were gripped with a fever of anxiety. Mercis lay strangely quiet, the calm before the storm. In another moment the air would be rent with a hell of heat rays and atomite blasts. To return the fire meant the slaughter of their own people. Now they were able to pick out the crystaloid dome of the Hall of Learning, the Gros Canal, alive with boats, the gleaming solex cupola of the citadels.

Suddenly the indicator of the audiovisor glowed. Turning the dials, Greg saw a man's face appear on the screen. A Rihn, his head bound, but his eyes glowed with triumph.

"Heroes of space!" he cried. "Mars is yours. The message you sent two days ago has inspired our people to rise, to conquer. For months we have been planning a drive for freedom, secretly manufacturing weapons, organizing our forces. The Thelists were frightened by the loss of their fleet. They offered only feeble resistance. Except for the great fortress on the plains of Psidis, we have been everywhere victorious. The people of Mars wait to acclaim you!"

"And Karragon?" Greg demanded.

The man's face clouded. "Karragon alone holds the Psidis fortress. And we dare not fire upon him because—" He hesitated.

"Well?" Greg grated. "Out with it!"

"Because he has taken Joan Vail as a hostage to insure his safety."

For a long moment Greg stared unseeingly at the audiovisor. Joan . . . in the hands of Karragon! What horrors would the sadistic dictator perpetrate to avenge himself upon the man who had blasted his plans?

Greg's face was pale, drawn, as he spun the audiovisor dials, contacted the other two ships. Old Zoab was tenderly sympathetic, Victis blazing with anger. Greg nodded dully in response to their words.

"We proceed at once to Psidis," he muttered mechanically.

IN a few minutes the three space ships were hovering above that drab red plain.

"Karragon!" Greg turned to the audiovisor once more. "Karragon, Madman of Mars!"

"Ah, Zhor." The dictator's oily voice echoed through the control room. "I have been expecting you. Allow me to show you something which I know will interest you."

Figures took shape on the screen. Greg could see the interior of the fort, a small room lined with levers, dials, instruments. From that room, one man could control the giant engines of destruction that lay below.

Seated upon a small stool was Karragon, adjusting the connections of a square metal box, like a twentieth century camera. On the other side of the room, lashed to a metal framework, was Joan Vail.

"Look, Greg Zhors!" Karragon laughed harshly. "Lovely, isn't she? Worthy of a queen's ransom. She shall be yours — in exchange for Mars!"

"Mars is not mine to give."

"But the weapon with which you so easily destroyed my space fleet? With it I could conquer Mars . . . the entire Solar System!" A wild light gleamed in Karragon's eyes. "Let me have the secret of the weapon, Greg

Zhor. I will give you this woman!"

"No!" Joan's voice was strong with courage. "Greg, you can't!"

High above in the space cruiser, Greg stared at the screen with tortured eyes. He had fought against overwhelming odds. He had driven himself remorselessly. He devoted his whole existence to the freeing of the woman he loved— Now, in his hour of triumph, he must forfeit her life for the future of humanity!

"You are thinking, no doubt, of refusing my offer," Karragon observed sardonically. "Perhaps in a few minutes you may change your mind. Have you noticed this little metal box beside me? It emanates a vibratory wave of the same length as the electrical impulses of the human nervous system. In a mild form it causes every nerve to tingle pleasantly. This projector, however, is powered up to a million volts.

"If you were to prick your finger with a white-hot needle, it would hurt. Can you conceive of every nerve of the human body being touched by white-hot needles along every inch of its length? The pain is unbelievable. More, since it does no physical damage to the subject, he—or she—may live for days. Of course the pain drives our subject mad, but that doesn't stop the agony. Let me demonstrate the effect of a mere hundred thousand volts."

As he spoke, Karragon touched a lever. A beam of violet light shot from the metal box, suffusing the girl's slim figure. For an instant her body tensed, surging forward against her bonds until the ropes bit into the soft flesh. A shrill, agonized scream burst from her lips.

"A very satisfactory demonstration," Karragon chuckled. "We will now try five hundred thousand volts. Observe closely, Greg Zhor."

HIS spatulate fingers moved the lever another notch. Joan's face was a distorted mask. Her body twitched, her eyes reflected the horrible suffering that racked every nerve.

"Greg!" she moaned. "Greg! I . . . I can't stand it!"

"The next notch will be a full million volts," Karragon said smoothly. "But perhaps you will reconsider my offer before I provide the ultimate test."

Standing in front of the cruiser's audiovisor, Greg was frozen with speechless horror. One thought alone kept pounding through his brain. Better to kill her than permit such torture. He reached for the switch of the re-creator. Fluorine. . . .

And then suddenly on the screen he saw it, a thin wall of iron rising from the floor, cutting Joan off from the pain projector.

"Greg!" It was Zoab's voice on the intra-ship micro-wave. "The re-creator!"

A flash of understanding swept over Greg. With frenzied haste he pressed the key of the selector marked Fe. Into the maw of the recreator Bar El thrust block after block of the radium, shouting to the others to bring more fuel from the bins. With the three ships working in unison, the wall rose with incredible rapidity. Now only Joan's head and and shoulders were exposed. Karragon, watching the wall appear as if by magic, stumbled backward in abject terror, sending the pain projector crashing to the floor.

With Joan completely shielded, another wall began to appear in front of Karragon, pinning him in a small corner of the room. Livid with fear, the dictator drew his heat gun, blasted at the growing wall. It melted under the ray. But the molten metal, trickling toward him, forced Karragon back against the side of the fort.

Inexorably a third wall began to rise a few inches from him, sealing him in a gray prison. Being only a few feet wide, it rose more rapidly than the others. Backed in his corner, Karragon was a weak, palsied figure.

In the space ship high above, Greg moved the twin beams back and forth, a grim smile on his lips. Through the audiovisor he could see the rising iron wall, the dictator's panic-stricken face. Karragon was helpless. To use his heat ray on an object so close would mean burning himself to a crisp. He was captured. They would drag him back to Mercis for a trial that could have only one outcome. The wall was

waist-high now. In another moment. . . .

With the frenzy of despair Karragon leaped forward, seeking to vault over the barrier before it shut him off completely. Greg, watching, tried to shut off the re-creator. It was too late. The dictator seemed to swell.

With a sickening, bursting sound, he fell to the floor in a welter of blood. Iron, forming within him, had torn his body apart.

THE three cruisers came to rest on the plain beside the fort. Close range blasts from the heat rays tore open the doors.

Running into the gloomy building, Greg turned his atomite rifle on the thin wall of iron behind which Joan lay. As it melted away he could see her, still lashed to the steel framework. Then he was cutting her bonds, carrying her toward the ship.

"Greg!" she whispered, a ghost of a smile on her wan features. "I . . . I knew you would come!"

"Joan!" he moaned hungrily.

Watching them, old Zoab nodded soberly. "That also is re-creation," he said. "The greatest force of all has created for them a new world, a new life, a new understanding."

"And for us?" Bar El rumbled.

Zoab stared at the red Martian desert.

Swift dusk was quickly turning black. Beyond the horizon, though, he could see the lights of Mercis—white, pure—hopeful.

"We have our world again," he breathed. "It is enough."

"Aye," Bar El boomed softly. "It is enough."

Next Month: THE WORLDS OF TOMORROW, a Complete Novel of Interplanetary Thrills by MANLY WADE WELLMAN

●

DO you know the seven wonders of the world? They're biology, chemistry, physics, astronomy, botany, geology and zoology—as far as this department is concerned! So here's another special streamlined shipment of scientific stickers and stumpers. Solve 'em, or else—turn to page 129 for the correct answers!

POSITIVE OR NEGATIVE?

The following statements are either true or false. Many a true word is spoken in jest, so look before you pick. (Par for this course—15 correct.)

1. Mars is the only planet of which the rotation period is known with great accuracy.
2. Yeasts possess two methods of reproduction.
3. Iron is responsible for practically all the coloration of ordinary rocks.
4. There is no relation between the distance of a planet from the sun and its period.
5. In a fluid which is in motion there is an increase in pressure wherever the speed is increased.
6. Chlorine does not occur native.
7. A color-blind man and a normal woman may produce color-blind children.
8. The color of light depends solely on its wave-length.
9. Insects comprise by far the largest taxonomic division of the animal kingdom.
10. It is possible to calculate all the elements of a planet's orbit from two accurate observations of its right ascension and declination, separated by a few weeks.
11. There are certain alloys of nonmagnetic materials like manganese, copper, and aluminum which are strongly magnetic.
12. Although nitrogen is non-poisonous, it suffocates small animals placed in it.
13. The absence of twinkling in the sky distinguishes planets from stars.
14. Grapes are climbing plants.
15. Zebras occur only in Africa and Asia.
16. The parathyroid glands are usually two in number.
17. The polarization of light shows that light waves are transverse rather than longitudinal vibrations.
18. The heat and light of the sun are so intense that we cannot look directly at it with a telescope.
19. Biological, rather than chemical, methods were responsible for the discovery of vitamins.
20. Though the moon is the nearest to us of all the heavenly bodies, it is far more difficult to weight it than to determine the mass of the planet Neptune.

TAKE A LETTER

Here are ten incomplete scientific facts. Three or more suggestions are offered as possible fill-ins for each statement, but in each case only one is correct. These ought to be easy—if you know your scientific vitamins from alpha to omega. (Par for this group—7 correct.)

1. The albedo of a planet is determined by observations with the: (a) spectroscope, (b) photometer, (c) telescope, (d) electroscope.
2. If the Earth had a satellite with a period of eight months, its distance would be: (a) 4 times that of the moon, (b) six times, (c) eight times, (d) 12 times.
3. The average interval between corresponding high waters of tides on successive days is: (a) 24 hours, 21 minutes, (b) 24 hours, 31 minutes, (c) 24 hours, 41 minutes, (d) 24 hours, 51 minutes.
4. The resistance of most substances increases as the temperature rises. An exception is: (a) copper, (b) tungsten, (c) carbon, (d) iron.
5. When an electric current flows through a solution of salt and water, the solution is warmed and is surrounded by a: (a) vapor, (b) magnetic field, (c) spark gap, (d) rainbow.
6. If you wanted to do some research on the Islands of Langerhans you'd look in a book on: (a) geography, (b) astronomy, (c) biology, (d) geology.

7. The first organ in which digestion begins is the: (a) mouth, (b) esophagus, (c) stomach, (d) intestines.
8. When the moon has the same longitude as the sun, the moon is said to be in: (a) half moon, (b) full moon, (c) eclipse, (d) conjunction.
9. In any frictionless machine the relation of the input to the output is: (a) equal, (b) less, (c) more, (d) varies according to the time.
10. The northern hemisphere receives the most heat in 24 hours at the time of the: (a) vernal equinox, (b) autumnal equinox, (c) summer solstice, (d) winter solstice.

SPECTRUM ANALYSIS

This round is dedicated to Oscar J. Friend's story in this issue, "The Stolen Spectrum." The following terms, when shifted around in their proper order, all pertain to the spectrum. Number 2 is on your hat. (Par for this stretch—6 correct.)

1. tlis
2. nabd
3. sirpm
4. serveer
5. graintg
6. ginhutsl
7. motoricall
8. poisine
9. traincoref
10. funrearfoh

METER-OLOGY

Do you know your meters and scopes? Each of the items in the right-hand column bears some relation to one of the terms in the left-hand column. In the parentheses below put the number of the corresponding term in the left-hand column which matches with the scope or meter in the other column. (Par for this circuit—8 correct.)

(1) Pyroscope	( ) Sun
(2) Micrometer	( ) Colloidal Solutions
(3) Helioscope	( ) Plane-Polarized Light
(4) Hygroscope	( ) Velocity of Projectiles
(5) Fluoroscope	( ) Specific Gravity of Liquids
(6) Chronoscope	( ) Intensity of Heat Radiation
(7) Transit	( ) Humidity of the Air
(8) Sextant	( ) Heat of Combustion of Illuminating Gas
(9) Ultramicroscope	( ) Effect of X-Rays
(10) Continuous-Flow Calorimeter	( ) Sun's Altitude at Noon
(11) Nicol Prism	( ) Star's Passage Across the Meridian
(12) Pyknometer	( ) Positions of Comets

THROUGH THE TELESCOPE

Here's our last and final session — on telescopes. Anybody can look through them, but can you tell what makes them see? See if you can fill in each of the blanks below with its proper term. (Par for this lap—8 correct.)

Telescopes are of two kinds—the refractor and reflector, of which the ———— was the first to be invented.

A ———— telescope consists of an object-glass which collects the rays of light from a star to a focus where a tiny image is formed. Here is placed an ———— which magnifies this image, and through this the observer looks. The power of the telescope depends upon the size of the ————, and as this is increased the chromatic aberration is ————.

———— decided that it was impossible to overcome chromatic aberration in this type of telescope, and determined to devise a new form of instrument; thus he invented the ———— telescope.

In this type a mirror is placed at the ———— of an open tube. The mirror being ground to a certain curvature, the rays of light from a star are reflected back up the tube to a ————, suspended near the top in such a manner as not to interfere with the passage of light rays from the star to the mirror.

The reflector costs ———— and is easier to make than the refractor. On the other hand, the ———— telescope is a great advantage when air currents are present in the observatory. The ———— telescope is generally employed in celestial photography, for the visual and chemical focal points are identical, and this is not the case with the other type.

WHAT'S YOUR SCIENCE I.Q.?

After you've completed the **SCIENCE QUIZ** and checked your results with the correct answers, get a slide-rule and calculate your score. Here's how you rate:

60-64—Superman
49-59—Mental Marvel
39-48—B.B. (Bachelor of Bookworms)
30-38—Try Crossword Puzzles
15-29—Stick to Fiction
0-14—Absolute Zero

THE COMEDY OF ERAS

Pete Manx

A Pete Manx Story

By

KELVIN KENT

Author of "Knight Must Fall," "Science Is Golden," etc.

PETE MANX was hurt. There he stood, resplendent in a bright green suit, specially tailored to fit his squat form, with a maroon shirt and a salmon-pink necktie that was positively blinding. Not Solomon in all his glory had ever been arrayed thus. A little admiration—even a casual comment—would have bucked Pete up tremendously. But, instead, he was being ignored while Doctor Mayhem and Professor Aker were arguing excitedly.

"I repeat—Bacon!" Mayhem said firmly, and set down a test-tube in its rack with more force than was strictly necessary. His small, scrawny figure trembled with indignation.

So that was it. They were talking about chow. Well, Pete could give them a few pointers on that. He had once run a hamburger stand at Ocean Park between jobs as barker and concessionaire.

"Ever try a cheeseburger, Doc?" he put in. "I can—"

"Shakespeare!" bellowed Professor Aker. The shout shook rheostats and power cables as the scientist slammed one fat fist into another. He clutched at his pince-nez as they fell to dangle by a black ribbon against his bulky paunch. "Every principle of psychology tends to prove that William Shakespeare wrote the plays."

Mayhem sneered. "I admit the sonnets," he observed, "but you have the colossal nerve to contend—in my own laboratory—that Francis Bacon did not write *Romeo* and *Macbeth* and—"

"Hey!" said Pete. "You're both wrong. MGM wrote *Romeo and Juliet* —or maybe it was Paramount, I forget. I saw it at the Capital."

Aker turned to confront this new antagonist.

"Pete," he murmured, "this may be a shock to you, but *Romeo* was first written during the reign of Queen Elizabeth, in England. And where in the sacred name of Einstein did you get that fantastic garment you're wearing?"

"You like it?" Pete preened himself. "Pipe the shoes. Two-tone. Yellow and red. Latest thing out. Boy, do I wow 'em down along Broadway."

Aker moaned slightly, but said nothing.

"That ain't what I dropped in for, though," Mr. Manx beamed. "I just wanted to say adios. I'm taking a vacation."

Professor Aker, still mumbling

The contagion of swing swept the Mermaid Tavern

about Shakespeare, paid little attention as Pete went on.

"I'm kinda strapped just now, but I figure I can pick up some dough in Florida. Start a concession or something. I need a change of air, anyhow—"

"Bacon!" said Doctor Mayhem. "If I could prove it—"

"Whup!" said Professor Aker, his jaw sagging into his chins. "Mayhem! You can!"

THE eyes of the two men met, exchanged understanding glances Then, slowly, their gaze swiveled to Pete, who suddenly began to sweat.

"No!" he burst out. "I ain't going to do it."

"What?" There was an ominous note in Aker's silky tone.

"I dunno, but whatever it is—"

"Look," said Mayhem ingratiatingly, "you said you needed a vacation and were short of dough. How'd you like to make a thousand dollars and get a free vacation at the same time?"

"Where to?" Pete demanded suspiciously.

"Er—England."

"I been to England. In that screwy time machine of yours. One time I went back to Robin Hood's time, and once to King Arthur's administration. I—hey! You don't mean?"

"Ah, yes." Mayhem smiled. "It won't hurt a bit, Pete. You know that. Just a little trip into time to prove

Leaper Merrily Trips From Bard to Verse!

that Bacon wrote the plays attributed to Shakespeare."

"No." Mr. Manx sounded stubborn. "Look—you send me back to Rome and I get thrown to the lions. In Egypt I get put on a chain gang. Last time I was in England they tried to burn me at the stake. Nineteen-forty suits me. All I have to worry about is the census and my income tax."

"But those were uncivilized times," Aker put in his oar. "Elizabethan England was a cultured period. They had bowling, football—and when you met anybody, you didn't have to shake hands. You could kiss them. Erasmus and Cavendish mention that particularly."

"Nuts," Pete observed, but there was a twinkle in his eyes. "Dames is poison. Bowling, huh?"

"Yes. And—dice, card parties—Sir Christopher Hatton once gave a party and put a thousand pounds at the disposal of his guests."

"Five grand, huh? Well—"

"All you have to do is just drop into England, find out who wrote the Shakespearean plays, and then return. That's one question only you can settle for us. For many years scholars have debated whether or not Shakespeare himself wrote all the plays credited to his name. Some savants claim that the famous Francis Bacon wrote Shakespeare's plays. You won't have to stay long to get the real lowdown."

Mayhem thrust a wad of greenbacks into Pete's hand and led the slightly hypnotized man to a seat that resembled an electric chair, what with wires and gadgets strewn all over it. "Sit down," the professor said silkily. "That's it. Now—" He turned to make adjustments on a switchboard.

"But I ain't sure—" Pete was counting the money.

"Time has no objective reality," said Mayhem, flipping a control lever. "We may consider it as a closed circle revolving about a Central Time Consciousness. We live on the rim of the wheel. All we need do is send the ego toward the hub of that circle, and then back out to the other side. There it emerges in a different time-sector, inhabiting the body of some contemporary organism. I send your consciousness back into time—"

"Now wait," said Pete, pocketing the dough. "I got an idea I'm being high-pressured into—*urlp!*"

Woosh!

Manx, after a momentary stiffness, relaxed in the chair. He was not breathing. He looked very much like a corpse.

"Good," said Mayhem, rubbing his hands. "I'll bring him back in a few hours, and then he'll tell you that Bacon wrote the plays, not Shakespeare. You'll see."

Aker was lighting a cigar.

"A few hours? I hate to mention this, Mayhem, but you've just burned out that condenser. I told you weeks ago to get it replaced. It'll take days or longer to have a duplicate made."

"What?" Mayhem rushed over to examine the apparatus. "You're right! Good Lord, I'd forgotten. Why didn't you say something before?"

Aker smiled unpleasantly.

"As our friend Mr. Manx would remark, I hesitate to stick my neck out." He shrugged. "Doesn't matter. How do you expect Pete to find out anything in a few hours? It'll take days —and now there's no chance of your getting soft-hearted and bringing him back before he has a chance to learn the truth."

"But — but — " Mayhem sputtered. "He may get in trouble!"

"He always does," the professor admitted. "But he always gets out of it!"

THE world stopped whirling about Pete Manx. He drew a deep breath, opened his eyes, and looked around. He was staring at a corpse.

It was very old, and very dead. It hung in a sloppy-looking fashion from a gallows, against which a ladder had been placed, and a starved cur was crouching nearby, licking its chops. Pete said *"Ulp"* in a shocked voice and turned hastily away.

He was only a few feet from a stone bridge, so crowded with houses that it resembled a continued street. On this was built a tower, on the top of which several human heads were stuck on

spikes. The general effect was neat but not gaudy.

Several people were standing beside Pete, examining the corpse on the gallows. They were dressed, apparently, for a masquerade. The women wore voluminous garments and hoods, and the men were clad in ruffs, knee-breeches and leather jerkins. Pete, examining his own figure, found that he was clad similarly, though in somewhat finer apparel.

"Cultured period, huh?" Manx inquired bitterly of thin air. "It looks like it. First thing happens I run into a stiff!"

"By'r lakin, he does look stiff," said a swarthy ragamuffin who was contemplatively picking his teeth. "Poor Enas. Well, he'll cut no more purse-strings."

"Oh," Pete responded blankly. "Petty larceny. And they hang you for that?"

"He got off easy," said the other. "He might have been drawn and quartered."

Pete considered. This was a murderously active time-sector, it appeared, but at least he wouldn't have to stay long. What had Doctor Mayhem promised? A few hours . . . well, that didn't leave much time to do his job. He'd have to get busy.

"I'm looking for a ham named Shakespeare," he said to the dark man. "Know anything about him?"

"Mayhap. Who are you?"

Pete felt in his pockets. No card-case. He didn't even know what he looked like, whose body he was inhabiting in Elizabethan England. Well—

"Manx," he said. "Pete Manx."

"You're dressed like a noble, but—you mean Master Will no harm?"

"Nope. I just want some inside dope."

The other pondered, and finally gave Pete instructions.

"The Globe Theatre is the place. Or he may be at the Mermaid Tavern. Follow this street—"

It wasn't difficult to find the Globe Theatre, even though it resembled an inn more than anything else. But Master Will wasn't there. Pete was told to try the Mermaid Tavern.

"He'll be swilling ale with Ben and Kit," said the informant, a tall man with haggard eyes. "God knows *I* can't do anything with him. We need a third act and he keeps yelling that he's in a slump. Preserve me from writers and temperament!" He threw up his hands and left.

Pete found the Tavern, without further adventure. It looked like a beer-joint on Hallowe'en. Men in bizarre costumes were sitting at the oaken tables, banging their drinking cups and shouting a song in loud chorus.

"Sleep, I say, fond fancy,
And leave my thoughts molesting—"

PETE grunted and stood staring around until a fat man in a white apron came bustling up.

"How may I serve you, my lord?"

"I'm looking for a guy named Shakespeare."

"Master Will? He'll be along presently. He ran out when one of his creditors came in. Why do you wish to see him?"

Pete made a placating gesture.

"It's okay. Everything's on the up and up. I'm just one of the boys."

The inn-keeper still looked suspicious, but gestured toward a table.

"There sit Kit Marlowe and Ben Jonson, two of his closest friends. Oh, Ben! Here's a man to see Will."

A burly gentleman in stained garments pushed a blonde off his knee and turned to stare at Pete. He hiccuped slightly, drank ale, and nodded.

"Sit with us, stranger. Who are you?"

Pete told them.

"Manx? Then you're no gentleman."

"Oh, yeah? Listen, wise guy, my old man used to be a Tammany alderman and—"

"Nay, nay," said Ben Jonson. "I meant not to offend you. We strolling players and playwrights aren't lords, you know."

Pete was pacified. He made a broad gesture.

"I get it. I'm in the same racket myself. Ran a bingo joint in Ocean Park till the D. A. clamped down."

The other man, Kit Marlowe, frowned, his lean face twisting surprisingly.

"Yet you're dressed as a noble. How—"

Manx searched his capacious memory and brought up a gem to help explain himself.

"A rose by any other monicker smells the same," he misquoted.

Marlowe and Jonson exchanged surprised glances.

"You know our Will's plays! Come, we must drink to that. He'll be glad to see you when he returns."

Ale was supplied—heady, strong stuff, which Pete gulped thirstily.

"Okay," he said. "Have one on me. Make it a boilermaker, Doc," he instructed the inn-keeper, who merely gaped.

Pete had to explain what a boilermaker was. Jonson and Marlowe were delighted with the new concoction.

"'Tis a wondrous combination, Pete," Ben chuckled. "I like it!"

Manx, luckily, found gold in a purse at his belt, and paid the bill. For not the first time he wondered whose body he was inhabiting. There was, of course, no clue.

Time passed and liquor flowed. Occasionally a group would burst into song. Each time Pete writhed.

"That's corny," Manx finally said in disgust. "Wish there was an electric phonograph here."

A minstrel in green tights wandered by the table. He exhibited a lute and plucked at its strings, bursting into a dreary song about a lady who looked like a dove.

"Corny," said Pete. "Come on. Give. Shake it, hep-cat."

The minstrel turned purple.

"I suppose you could do better!"

"Sure," Manx agreed, with slightly intoxicated assurance. "Gimme that zither."

"I used to handle a banjo in a medicine show," he told his companions. "Let's see, now. . . ."

He launched into song. He was, it appeared, heading for the last roundup. The room grew still.

"Odd," said Ben, when the solo was finished. "Methinks 'tis odd enough. But—"

"Okay." Pete grunted. "I'll give you some jive."

Manx's rendition of the "Yodelin' Jive" was greeted with a storm of applause. Men banged cups on their tables and yelled for more. A sad looking chap with a high, bald forehead wandered in and looked around vaguely.

"Here's Will!" Ben yelped. "Will! Over here!"

MASTER SHAKESPEARE dragged himself to the table.

"I am going mad," he announced, peering around in a dazed fashion. "Commercialism will ruin art yet. How in God's name can I write my novel when they keep yelling for those awful plays?"

"You and your novel," Ben boomed with affectionate contempt. "Money's the thing, my lad. Forget about art and stick to your plays. They're making pounds and guineas—"

"If the Queen would only condescend to view a performance, my fortune would be made. But I'm stuck for a third act on that thrice-accursed *Midsummer Night's Dream.* Bah."

Pete looked hazily at Will. "It's been done," he remarked. "Warner Brothers made it a couple of years ago. Boy, did it smell. Mickey Rooney was good, though."

Shakespeare downed a stoup of ale in one swallow.

"What d'you mean, it's been done! I haven't finished writing it."

"All I know is what I saw. Guy with a donkey's head. Bottom, his name was—that was Jimmy Cagney."

"A donkey's head for Bottom!" Shakespeare leaned forward, his eyes glittering. "What an idea! It's ridiculous—"

"It's great!" Ben Jonson boomed. "The audience would go wild. They love that stuff."

"It's—eh? Perchance you're right." Will looked at Pete again. "Tell me more of this, friend."

Manx obliged. His memory was rather hazy, but it improved as he drank on. He detailed the plot of the *Midsummer Night's Dream.*

"Wonderful!" Shakespeare was beaming. "Those added scenes will

make my play! I'll write it up just like that."

Marlowe shook his head.

"It's plagiarism, Will. They're still talking about your *Othello.*"

Will considered.

"Where was this play produced? America, you say? Well! Some little kingdom in Europe—it doesn't matter. Nobody'll know the difference."

"I got a million of 'em," Pete said generously. "But what makes a good play is blood. Lots of it. Say, I remember a Karloff picture—or was it *Dr. Jekyll and Mr. Hyde?*—where a guy kept changing from a hero to a heel. He—"

Manx rambled on, while Shakespeare listened. Presently the great playwright began to murmur something about Ariel and Caliban.

"Say, you guys should have seen Bette Davis in *Elizabeth and Essex,*" Manx went on.

There was a dead silence. Pete looked around.

"What's the matter? Did I say something?"

"Quiet," Marlowe hissed. "There may be spies here. 'Tis dangerous to hint at such matters—even treasonable."

"Oh," said Pete, remembering. "I get it. Then Bette and Errol really are that way about each other."

The silence grew strained. Manx broke it by reaching for the lute.

"You birds never heard Cab Calloway," he announced. "Brothers, prepare for something. I'm going to dish out some boogie-woogie."

"It was daooon in Chinatown. . . ." Pete caroled. His fingers flashed over the strings. This, he decided, was fun. "Come on, Pete," he whispered to himself. "Give! Get hot!—*and there was Minnie*—join in, boys!"

"Minnie the Moocher!"

"Kicking the gong around!"

OTHER lutes appeared and followed the tune Pete set. One by one voices were raised, with Ben Jonson's bull-like bass leading all the rest.

"Some were high—"

"And some were mighty low!"

The inn-keeper stood against the wall with his mouth wide open, staring at this madhouse. Dignity was lost. The contagion of swing swept the Mermaid Tavern.

Pete tossed the lute away and sprang up, indulging in some fancy rug-cutting. Ben Jonson joined him, and then Shakespeare. Several girls appeared, and, with feminine instinct of rhythm, quickly joined the jive.

"Madmen!" gasped the inn-keeper. "They are possessed."

"Hi-de-hi—" shrilled Will Shakespeare.

"Ho-de-ho—" boomed Ben Jonson.

"And there was Minnie!" That was Kit Marlowe, the renowned Elizabethan dramatist and poet.

"Kicking the gong around!"

That was the Mermaid Tavern!

"Hold!"

An icy voice cut in on the merriment. Slowly silence descended. Pete felt Jonson's huge hand grip his shoulder.

"Friends of yours?" Ben asked.

Two men—nobles by their apparel—were pushing forward. One was fairly young, with a weak, foppish face. The other was about fifty or more and resembled a rather vicious gopher.

"Hah!" said the gopher. "There you are!"

"Zooks!" the other gasped. "You gave us a merry chase. Why you spend your time in these low haunts I don't know. The Queen wants to see you. It's important."

"The Queen!" Ben Jonson stared at Pete. "You *are* a noble, then."

"I ain't," Manx snapped, annoyed at the interruption. "Go 'way. I'm busy."

"But, cousin—"

"Nuts."

Will Shakespeare came forward unsteadily and examined the two new arrivals.

"To be or not to be," he announced. "That is the question. Who are you—uh—"

"Mugs," Pete supplied.

"Thanks," Will beamed. "Who are you mugs?"

"I am Robert Cecil," said the young man. "And this is Lord Burghley."

"I'm your uncle, in case you're too befuddled to remember," Burghley snapped, glaring at Pete, who blandly picked up a lute from a nearby table.

"Scram, pickle-puss," he murmured. "I'm busy." And he began to sing about Minnie the Moocher. With a booming snort of disgust Lord Burghley fled.

ROBERT CECIL lingered.

"You must see the Queen," he urged. "Edward Coke is trying to ruin you, and not even Essex can help you unless—"

His voice was drowned in a thundering chorus.

"Hi-de-hi! Ho-de-ho! And there was Minnie—"

"Kicking the gong around," caroled Pete Manx and Will Shakespeare, their arms about each other's necks, while the inn-keeper of the Mermaid Tavern stared in shocked horror at the unprecedented sight of Kit Marlowe and Ben Jonson indulging in a display of rug-cutting that had never been seen in Elizabethan England.

Well, he had really achieved his aim, Manx told himself. Shakespeare had written his own plays; that was obvious. But, somehow, the expected return to 1940 and the Doc's laboratory did not come. For some reason this delay did not worry the happy-go-lucky Manx. He was having a swell time.

He visited the Globe Theatre and suggested certain changes—seats, for example, in the balcony and the pit. His purse still bulged with gold, and he roomed in the Mermaid Tavern, spending his nights carousing with Will, Ben, and Kit. The inn shook with shag. It shuddered with swing and jerked with jive. The word spread.

Gentlemen flocked to the Tavern. First came the gay blades, and then the older men. They lost their dignity and joined in the chorus of Minnie the Moocher. Pete bent his energies to constructing an orchestra, and finally succeeded. The boys gave for all they were worth.

The Globe Theatre was altered in several respects. Boys w a n d e r e d about between acts selling sweets and certain small boxes which, they contended, contained valuable prizes. *Midsummer Night's Dream* was produced and went over with a bang. Meanwhile, Shakespeare persisted in pumping Pete for anecdotes he was quite willing to supply.

"So this guy's moll waits till he's asleep and pours hot lead in his ear, see?"

"*Hamlet!* The very thing!" Shakespeare enthused.

"But the old gag's still the best," Manx told the playwright. "Boy meets girl—boy loses girl—boy gets girl."

"Ah," said Will Shakespeare, "that's an idea. My Verona plot needs further development. I'm stuck for a twist."

"What's it about?"

"Oh, I don't really know, yet. A man named Montague is at odds with one named Capulet."

"That reminds me of something," Manx pondered. "I got it. A picture I saw a while ago. . . . Look, why not give Capulet a daughter and Montague a son, and let the sprouts fall in love? Call the boy Romeo and the girl Juliet."

"'Tis an idea," Will Shakespeare nodded. "Tell me more. Though I wish I had time to write my novel. . . ."

He fell silent as Pete recounted the plot of Romeo and Juliet.

The idea struck fire. Master Will fell to work, scribbling busily with his quill. And, presently, the new play was put into rehearsal.

"That balcony scene's swell," Manx applauded, but Will shook his head gloomily.

"I think I'd better cut that out. It lacks fire."

THE play opened and was a tremendous success. On the fourth night of the run trouble started. A handsome, well-dressed noble in a short beard cornered Pete.

"Good heavens, where have you been? I've been looking for you everywhere!"

"Oh, hello," Manx said vaguely. "I've been staying here at the Mermaid."

"They told me I'd find you here. Elizabeth's foaming at the mouth. Coke's trying to get that job of Attorney-General away from you—"

"Coke?" Pete remembered that Lord Burghley or Robert Cecil had mentioned the name some time before, during his first night at the Mermaid.

"Yes, yes, yes, Coke. Edward Coke, the lawyer. Your deadliest enemy. Listen to me. I may be able to calm Elizabeth, but I'm not sure. Coke's told her where you've been hiding—with a gang of strolling players. I did my best for you. Said Will Shakespeare was the greatest dramatist in England. But she's—well, you know how Elizabeth is."

"Yeah," Pete nodded. "I know how she is. Or do I?"

"I've done what I could. The Queen's going to attend a performance two nights from now, at the Globe Theatre, in disguise. She said if Shakespeare is really as good as I said, she'll forgive you. But if he's a flop you'll be beheaded. And I'll be in trouble myself."

"Wow," Manx groaned. "What a dame. I still don't get it. Just what—"

"In two nights, the Queen will be in the audience. Tell these scoundrelly players of yours to do their utmost. Everything depends on Elizabeth's liking the play. If she does, you'll get the job of Attorney-General instead of Coke."

A page rushed in and handed the visitor a paper. The short beard wiggled.

"I must go. Good luck. I'll be with Elizabeth at the performance."

He fled, but Pete detained the page. Apparently he was supposed to know the bearded man, who certainly knew him. He asked the boy.

"The Earl of Essex," said the page, bowing low as he departed. Pete staggered to a table and called for a boilermaker.

"Essex! Elizabeth and — ouch! These things always happen to me! I still don't know who I am—but I'm a pal of Essex, if that means anything."

"A pal of Essex?" boomed Ben Jonson as he entered the tavern and lumbered forward. "Who? Never mind. I've news for you, Pete. Will's troupe has been arrested."

"What?" Manx spilled his drink. "Arrested? But—"

"Vagrancy's the charge," Ben said, smiling wryly. "The whole troupe's in gaol. They'll be released in a week, I hear. Some lawyer named Coke arranged it."

"Coke! Edward Coke? Wait a minute." Pete sat silently considering. He was beginning to understand. The Queen would attend a performance of *Romeo and Juliet* in two nights. But there'd be nobody to act out the play. Coke's stratagem would mean—

"Why, the double-crossing mouthpiece," Manx exploded. "I'll put the bee on him. Where's Will? We gotta get hold of the understudies."

"They're in gaol too," Ben explained.

"But we gotta put on the play in two nights! We—we—"

"We can't. Coke's got guards at the Globe and threatens to arrest any players on the stage for vagrancy."

Shakespeare wandered in, shaking his head.

"Hello, Pete. Hello, Ben. This business may give me time to write my novel, but I don't know. I wax despondent."

"You wax — eh?" Pete's jaw dropped. "Say! I've got an idea. You say Coke won't let any actors on the stage, Ben? And the players are all in the calaboose?"

"Right."

"Okay." Mr. Manx nodded slowly. "If I can get in to see the boys, I may be able to fix it yet. But it'll mean work. Listen!" He bent forward over the table and began to talk rapidly.

HALF an hour later several skilled artisans stood around Pete, watching him sketch on the table-top.

"The diaphragm goes here. Maybe parchment will do for that, or vellum. The needle arm's connected to the center of the diaphragm, and it sort of bends down—like that. There's the needle. The wax rolls—you do have wax in this time, don't you?"

"Of course," said one of the artisans. "But I don't understand—"

"You don't have to. Just do as I tell you. You talk into this horn and your voice hits the diaphragm and

jiggles it. That jiggles the needle, which keeps sliding over the wax rolls. They're turning, you see, and—"

Kit Marlowe dashed in.

"Here's the pass from Essex," he gasped. "It'll get you into the gaol and out again."

"Swell. Now I want a rush job, boys, and I'll check every step with you." His eyes twinkled mischievously. . . .

IT was almost curtain time. Manx peeped through the curtain at the audience.

"She ain't come yet," he said, "I guess. Wait a minute. There's Essex —and a frail with him. She's got a mask on."

Ben Jonson looked.

"That's the Queen, all right. Shall we get started?"

A burly man in uniform tapped Pete on the shoulder.

"We have our orders. If any player sets foot on this stage—"

"Yeah. We know. But Ben and Kit and Will and I ain't players. Come on, Will. Make your speech."

Master Shakespeare, however, had stage-fright. He was hiding in the wings, and Manx hastily took his place. As he marched on, he was horridly conscious of hundreds of eyes focused at him. Essex looked worried. The Queen's face was impassive.

"Uh—ladies and gentlemen," Pete gulped. "You're going to witness something entirely new and different. You got a habit of putting on plays here without scenery. Well, we're going one step further. We're putting on *Romeo and Juliet* tonight with plenty of scenery—but without actors!"

There was a dead silence as Manx fled. He rushed off the stage, ducked behind a screen set in the center, and gestured wildly at Kit Marlowe, who obediently lifted the curtain. The audience saw a back-drop painted to represent a street—supposedly in Verona, but, since Pete had sketched the scene, it was a bit puzzling to see an elevated railway near a palace that bore a suspicious resemblance to the Empire State Building. A voice said:

"Two households, both alike in dignity—"

The guards stood in the wings, staring. Neither Pete nor the others was talking. The voice, seemingly, emerged from a horn connected to a box over which Manx hovered, vigorously turning a crank. Manx had made the waxen records for his simple phonograph in the gaol.

The Prologue ended. Sampson and Gregory, of the house of Capulet, appeared invisibly on the stage.

"Gregory, o' my word, we'll not carry coals."

"No, for then we should be colliers."

Will Shakespeare had quietly fainted against a back-drop. Kit Marlowe was staring out at the audience and shaking his head despairingly. Only Ben was happy. He was slightly tipsy.

"What a time we had last night," he gurgled. "After you went to bed, Pete. We played your—what is it?—phonograph in the tavern, and even made a recording. What fun!"

"Sh-h!" Manx hissed. "The next record, quick!"

The guards were worried. Obviously they couldn't arrest players if there weren't any, but the performance was going on regardless. Yet the audience was cold.

Shakespeare woke up and passed out again. Kit was dripping with perspiration. Pete felt sick. This wasn't going over. Maybe it was too novel. And if the Queen didn't like it—what had Essex said? Beheading? Or maybe burning at the stake. Pete shut his eyes and shuddered. It was just a toss-up between a stake and a chop.

THE silence grew deadly. People began to leave. Kit had his hands over his eyes. Will awoke, listened a moment, gasped, "That damned balcony scene!" and passed out once more.

It was act two, scene two—Capulet's orchard. The famous balcony scene. Romeo entered invisibly.

His deep voice came out of the phonograph horn.

"He jests at scars that never felt a wound. But soft! What light through yonder window breaks. . . ." The

record ended. Pete automatically reached for the next, which should have been extended ready in Ben's hand. But Jonson was having trouble. He was fumbling desperately amid the cylinders.

"They're mixed up," he gurgled. "Quick! Ad lib!"

With a groan of horror Pete snatched the script from his pocket and searched for the place. Already hisses were coming from the audience on the other side of the screen. A moment more—

Pete found the place, but the letters blurred before his eyes. The old English script was difficult for him to read. He tried to imitate Romeo's voice, bending low over the phonograph so the guards would not notice that he was speaking.

"It—it is the east, and Juliet is the sun. Arise—f-f-fair sun, and—what the hell is this!—and—and blackout the moon, who is—who's got the pip . . . that thou art—art—art a honey more fair than she. . . ."

"Oh, my God!" Will Shakespeare gurgled, and collapsed once more. "What a profession! I'm going out and dig ditches for a living!"

The audience was in an uproar. Kit Marlowe was running around in circles. Ben Jonson was hopelessly fumbling with the wax records. Pete plunged on frantically.

"Two of the fairest stars . . . what if her lamps were there . . . her glims in heaven . . . oh, that I were a glove upon her hand, that I might—might—what is this, anyhow? . . . that I might get a handout!"

"Ay me!" Ben Jonson squeaked in Juliet's voice.

"She speaks!" Pete babbled hysterically. "Oh, speak again—"

"Got it!" Ben said jubilantly, slipping a record on the phonograph.

"Oh, speak, bright angel—"

BEN was busy, and the needle scratched across the wax. The phonograph's horn blared out sound. The bright angel spoke again:

"It was *down* in *Chinatown*—the cokeys lay around—some were *high* and some were mighty *loooow!*"

"Mighty low!" boomed the chorus of the Mermaid Tavern.

"There were millions on the floor—"

"Oh-oh," Ben said. "Wrong record. That's the one we made last night in the tavern."

"And *theeeah* was Minnie—*Minnie the Moocher!*—kicking the gong around!"

"Take it off!" Pete babbled. "Oh, we're sunk now! We—"

"Hold!" Kit Marlowe called from the wings. "Pete, they like it! They're going wild."

A chorus of shouts rose from the audience. The contagion of the jive swept out. Some of the onlookers had visited the Mermaid Tavern lately, and they began to jitterbug in the aisles. In a moment the Globe Theatre swung into action!

"If you don't know Minnie—"

"If you don't know Minnie!" roared the audience.

"Yahooo!" That was Ben Jonson, capering into view on the stage and setting the pace. "Swing it, boys! Give!"

"There was Minnie!"

Even the guards joined in, unable to resist. And Queen Elizabeth rose daintily to her feet, assisted by Essex, and—*swung!*

"There was Minnie—"

"MINNIE THE MOOCHER!"

"Kicking the gong around!"

By the time the record ended, the audience had collapsed in their seats. But Pete's quick brain had already made a plan. He continued *Romeo*—with certain additions. Between each act he played Minnie the Moocher.

Essex found him after the show.

"It's wonderful," the Earl babbled. "You'll be the next Attorney-General! The Queen's delighted. It's—"

"Aw, it's nothing," Pete said modestly. "Just a little idea of mine, that's all. Hey, Ben?"

"I hear you talking," remarked Ben Jonson. "Hi-de—"

Woosh!

DOCTOR MAYHEM had at last repaired his time machine.

Pete opened his eyes in the laboratory. He beamed happily at Professor Aker and the Doc.

"Hi," he greeted. "Had a swell time.

Wish you'd been along."

"What happened?" Aker demanded. "Shakespeare wrote the plays, didn't he?"

"Bacon!" Mayhem snapped. "Tell us just what happened, Pete."

"Okay," said Manx, gratefully lighting a cigarette. "Bacon had nothing to do with the set-up. Shakespeare wrote his own stuff. Listen. . . ." He launched into his tale, ignoring Mayhem's look of disappointment.

"So that's the whole thing," he finished. "Sorry, Doc, but you lose."

Aker was grinning.

"Next time don't argue with a psychologist," he said maliciously. "If—"

"Just a minute." Mayhem had an eyebrow cocked up. "You gave Will Shakespeare a lot of ideas, didn't you, Pete?"

"Oh, sure. He liked most of 'em. Wrote 'em up—"

"Never mind that. You gave Shakespeare ideas!" Mayhem turned to Aker.

"Professor," he told him, "I think you missed a few points. The man whose body Pete inhabited in the sixteenth century was a close friend of Essex. He was a cousin to Robert Cecil and a nephew of Lord Burghley. And his deadliest enemy was Edward Coke, the lawyer."

"So what?" Pete asked. "I never did find out who I was."

Mayhem was chuckling. "Ask Aker. He knows. That's right, Pete—you were a pal of Essex and an enemy of Coke. Your uncle was Lord Burghley. And—ha!—d'you know who Lord Burghley's nephew was?"

"No," Manx said blankly. "Who was he?"

"Sir Francis Bacon!" Mayhem howled, and bent double with laughter. "So Shakespeare wrote the plays! Wow! But Pete Manx gave Shakespeare the ideas—and it was Bacon's body you were inhabiting in Elizabethan times! Yaaah!" the Doctor observed, with a lamentable lack of dignity, to the departing back of Professor Aker. "Wise guy, huh? Come on, Pete. I'm going to buy you a drink."

"Okay, Doc," Manx smiled, rising. "I guess I earned it. That's what I call bringing home the Bacon!"

PROSPECTORS OF SPACE

By MALCOLM JAMESON

Author of "Mill of the Gods" etc.

Around the flaming globe was a magnificent halo of pale light

"Join Spaceways and See the Universe" Was the Slogan for All Pilots—But Not if You Wanted a Place in the Sun!

NEIL ALLEN called his father. In their cumbersome space suits the two stood in the twilight that passes for day on distant Triton. Their face plates were turned toward the jagged Dolphin Range, where the cabin lights of at least three space ships flickered. A stabbing

searchlight streamed down from the leader, probing the frozen wastes below.

Old man Allen's hand gripped the button of his phone transmitter.

"Solar Exploitation has come to take over, son. They're looking for us."

Neil's father had foretold this. It meant the end of his career. With the preemption of Triton would come the end of space prospecting. The Metal Trust had already absorbed everything in space. But the Allens had hoped they would be unmolested on far-away Triton.

Working by the light of torches, the twelve members of their crew were slicing away slabs of rhodium. In three days more they would have had a full cargo, a profit at last on the expensive round-trip from Neptune to the nearest Solar Exploitation refinery on Callisto.

The first ship of the Exploitation flotilla sighted the little wild-cat mining expedition. It settled to the floor of the crater, the two subordinate ships following. Flood-lights switched on, the space-lock opened, and three men in space suits stepped out.

Old man Allen had been through this little ceremony before. He knew just how helpless he was. In the old days, he and his crews had fought the claim-jumpers on the spot. But the Mining Law stopped that. It pretended to permit prospecting on any "uninhabited planetary body" while it gave monopolist rights to any organization that would colonize and exploit it systematically. He had fought that in the courts, and lost. The Law promoted orderly production, the politicians said, and curbed speculation.

The three strangers arrogantly advanced to the senior Allen and handed him a metal tube. In it was the duly certified eviction notice.

Horvick, General Superintendent of Space Mines, spoke harshly.

"You have your notice, Allen. Call your men and get out. I'm giving you a break with the stuff you already have on board. Legally it's ours."

"Yours!" retorted old man Allen bitterly. He knew that one of the men confronting him was a captain of the Space Patrol, sent to enforce the Law in the void. He choked back hot words, wheeled abruptly, ordered his men into the *Klondike*.

THE first week of the long drag back to earth, the old man maintained a moody silence. There was no point now in unloading at Callisto. They might as well go all the way and get the best price.

The *Klondike* was a staunch ship, built according to Allen's own plans thirty years before. Neil Allen had lived aboard her since he was a little tot. He knew the paths among the planets as well as old harbor pilots knew their rivers.

They passed within twenty million miles of Saturn. The old man sat at the starboard lookout port, gloomily eying the beauty of the ringed planet and its spectacular family of satellites. He knew he would never see them again.

Neil fiddled with the instruments. His steady eyes filled with concern for he realized how heavy this last blow had been.

"Neil," said his father at last. "For my own life, I have no regrets. This Triton business doesn't matter—I should have retired five years ago. But I did wrong in apprenticing you to a dying trade. All you can do is hire out to Exploitation."

"Not a chance, after what they've done to you."

"Let's face facts, Neil! Space prospecting is a thing of the past. As a free-lance, I was able to follow my hunches and not have to wrangle with a bunch of Earth-bound directors. You won't be able to free-lance. You've learned an obsolete occupation. In my day, there was the whole Solar System to work in. Buck Bowen and I were the first to mine the craters of the Moon. We moved on to Mars, then to the moons of Jupiter.

"That was when they passed the Mining Law. Exploitation came after us. They let us eliminate the poor spots, find out the dangers. But when we started bringing in loads of high-grade stuff regularly, we knew that Horvick and his gang would be along soon. Bowen and I split up after they grabbed Callisto. He thought there

was more chance in the planetoid belt. I thought surely they would let me alone around Uranus. Remember our camp on Oberon? They hounded Bowen the same way. One asteroid after another they took from him. The richer ones they towed in bodily, smelted them down entirely. Two years ago Bowen was doing fine with indium ore in the Anterior Trojans. Well, he's dead now—ruined by Exploitation. You might look up his son, Sam, when you get back. He's in the same fix you are—educated to be a prospector, with no place to prospect."

The old man bravely tried to tell some anecdote of the old days. He couldn't finish it. Haggard and worn, he went to his bunk.

WHEN Neil turned the *Klondike's* nose downward to pass beneath the asteroids, the old man handed him an envelope.

"Neil, this is my will. You'll have the *Klondike* and this cargo. There's a little money, too, in the Stellar Trust Company. I don't know what you'll do when that's gone. It ain't much."

"Cut it out, Dad. The System still has some unknown corners."

Allen shook his head. In the last few days he had weakened rapidly. The driving force in his life had been hard work. Neil groped for a suggestion that would renew the old man's urge to live.

"Dad, you were going up out of the ecliptic some time and look around. When we dump this load, let's do that."

"Not me," Allen answered wearily. "That's for you and Sam Bowen. Even with new methods it'll be a gamble. Play safe, Neil. You're as good at astrogation as you are mining. Get yourself a safe job."

"That's out!" declared Neil. "I'm following your lead as long as the old *Klondike* holds together!"

"Well, if that's the way you feel, go bring me that diamond-studded meteorite from the drawer of my desk."

Neil brought him the jagged piece of rock.

"This is what gave me my start in life. Bowen and I found tons of them that had fallen into the craters of the Moon. One summer we saw them, picked them up still hot. Draconids, they call them, and they have never been found anywhere else. That thing is nearly half-pure iridium." He fondled the aerolite reminiscently. "Maybe this is the answer for you, and for Buck's boy, too. Only, watch your step. It would break my heart if I thought you made the biggest find of all, and then had that skunk Horvick cash in on it."

Allen closed his eyes. Neil waited, but the old man had dropped off to sleep. He never woke up. . . .

AFTER his father's funeral on Earth, Neil Allen wasted no time in the personnel offices of the big companies. There was only one that he knew much about. But the thought of that one filled his heart with bitter rage, a hatred he focused on Horvick, its managing director and principal stockholder. His love of independence, inherited from his father, made him scorn employees as mere robots manipulated by schemers.

Instead, he planned. If tons of Draconids had been picked up on the Moon, there must be billions of them in space somewhere. After he sent a letter to the last known address of Sam Bowen he haunted the Planetarium and the Geological Museum. He made himself familiar with the workings of the Assay Office, the one place in the Solar System where reasonably pure metals could be sold without having to deal with the Metal Trust.

He concentrated on the meteor swarm known as the Draconids, and their related group, the December meteors, out of Scorpio. He learned all that was known on Earth about their orbits, their frequency, and their composition.

In three weeks his plan was clear. The old *Klondike* was cradled in the great central bay of the United Skyyards machine shop. Neil was all over the place, from drafting room to armature shop, checking the details and construction of his two pairs of electromagnets. Then came the work of installing them in the roomy cargo blisters that bulged from the *Klondike's* sides. His only helpers were Jim Hathaway, long-time Mate of the

Klondike, and five other members of the crew who had elected to stick by the ship. For years they had worked on the share basis.

It was in the *Klondike* that Sam Bowen found Neil the day before the job was finished. Sam's father's death had occurred about a year sooner, and he had already spent most of his modest inheritance looking for work. All he had left was the twin sister of the *Klondike*, Buck Bowen's old *Golconda*.

"It's tough," Sam declared venomously. "We won't sell ourselves to the Exploitation outfit, and Transgalactic Spaceways pays practically nothing. They can get all the pilots they want from kids that fall for the 'See the Universe' line. So what's left? Assay Office. That's loaded to the gunwales with political slickers. We're licked."

"Like hell we are," flared Neil "There's still a frontier. We'll do what Columbus did, what the old Forty-niners did, what your father and mine did. We'll *make* jobs for ourselves!"

"Yeah?" retorted Sam. "Out around Alpha Centauri or Tau Ceti. *If* they have planets, all we have to do is find a pair of females dizzy enough to marry us, and start out there on our honeymoon. Our kids could do the mining when they got there, and their kids could bring the stuff back!"

"Back down, Sam," interrupted Neil. "Listen to me. Did you ever happen to think that every explorer and prospector in history has stuck to the plane of the ecliptic? Of course the smart ones duck under the planetoid belt to skip a hammering. Your old man may even have chased a fat asteroid up ten degrees or so. But who really knows anything about what's above us or under us?"

"We have telescopes, haven't we?" countered Sam. But he was willing to listen. "Nobody wastes rocket fuel zipping around up there because nothing's there but a lot of scattered gravel and dust. You couldn't locate a ton of pay dirt in a million cubic miles. And if you did, it's hell working in a hail of iron nuggets. Why, out on Ceres—"

"I know, you had double repulsor screens. But do you think you could stand an iridium hail if you had a bucket to catch it in?"

NEIL sketched his plan. His father had learned that the meteor streams were really the debris of a defunct comet—Jenkins 368. It had long since disintegrated and scattered over its orbit, which intersected Earth's at an angle of about eighty degrees. The June and December meteors marked the nodes.

"All we have to do is plow along the orbit and gather 'em in," concluded Neil. "Not forgetting they are only half iron. The rest is iridium, rhodium, and stuff like that."

"But my *Golconda* isn't fitted with magnets. Where do I come in?"

"As a pack-horse. I figure to act as a sort of base ship. If I had to work it alone, I'd trail along until I caught a full load, then break away and come in with it sticking to me. But with you in the game, we can get several loads. You can peel me off every so often, bring a load in and sell it, and then come back for more. That way, we won't risk losing the swarm."

"If you ever find it, and there's anything there." Sam was still dubious. "Comets are thinner than smoke, even when they're all together."

Neil shrugged. "If prospecting was a sure thing, there wouldn't be any money in it. I know old Jenkins three-sixty-eight is spread out thin, but you can't laugh off those iridium meteors. If you want to come in, I'll swap a half interest in my ship for a half in yours. How about a partnership, Sam?"

"Well, it'll be a lot better than staying grounded." But a sudden doubt swept Sam's mind. "If we do clean up, what's to prevent Horvick from butting in with a fleet of Exploitation ships and sweeping the orbit clean?"

"Time, for one thing," replied Neil. "He's still out at Triton. They have no magnet-equipped ships—haven't even thought of it. If we work fast, there won't be anything left for them."

The next day the *Klondike* was ready. But the *Golconda* was still laid up. Sam would gather his crew and take on fuel and provisions. Neil furnished him with a copy of the coordinates of his proposed trajectory, which he could follow in a week.

Jim Hathaway raised the question of what should be done with the mining

gear the senior Allen had used. Neil ordered it all stowed in the cargo blisters. Since the ship's function was to act primarily as a magnet, the more massive she was, the better she would attract and hold the cosmic litter.

It was already June when Neil took off for the Moon. The Draconids were due to appear in a few days. He preferred to wait on the Moon. With no atmosphere, the visibility was better, and the take-off into the midst of the meteor swarm would be easier against the lesser gravitational pull.

He set the *Klondike* down in a roomy crater. Employees of the Exploitation company were already there, waiting for the semi-annual shower, to pick up the sky-nuggets as soon as they fell. The lunar manager of the company visited the parked *Klondike* and growled at them for trespassing on company property.

Neil glibly quoted the law permitting transcient vessels a three-day stay. Since his crew was not mining, the lunar manager could do nothing but walk away, muttering. However, he set a guard over the ship to see that no minerals were picked up.

AS soon as the shower started, Neil closed his hatches and fired his rockets. Along the old comet path he went, picking up speed. He turned on his repulsor screens, keeping a close watch on the needle as it registered the hits of meteors.

Gathering acceleration, he maneuvered cork-screw style, feeling for the center of the stream. When he was receiving the maximum of hits from the rear, he knew he was on the axis of the meteor stream. He straightened out, altering his course slightly from time to time to conform to the ellipse of the orbit.

It was several hours before the pelting from the rear ceased. He cut his rockets and drifted. He had a trifle too much momentum, for now the pelting came from ahead. He was overtaking the sky-gravel.

Cautiously he shot a few measured jets from his bow tubes. He jockeyed the *Klondike* until she was moving along among the perihelion-bound particles at little more than their own speed.

He swept the space about him with a spotlight. He had expected to sight bits of matter of all sizes floating near him. Instead, all the light revealed was an almost milky haze. Occasionally he caught the glint of reflected light from some tiny object, but the myriad of glistening nuggets he had hoped to see were missing. For space, though, the area about him must be unusually full. Never before, outside the atmosphere of a planet, had he been able to see the beam of his searchlight.

He cut his repulsor screens and started the huge generator. The instant it roared up to full speed, he threw a switch and set up his synthetic gravity field.

It was fully an hour before he noticed any result. He had expected to hear a rain of pellets against the hull, was even afraid that some larger aerolite might come crashing through. He alternated between the lookout ports, staring into space. In the pale beam of the searchlight, all he could see was swirling wisps of milky haze. At intervals a light thud told of a sizeable particle slamming against the skin.

Before long he noticed that the outer rims of the ports seemed to be encrusted with frost. Frost in the void? Impossible! But there it was, silvery, clinging to the port frames and hull. Several inches of ice covered the metal parts, growing swiftly until the glassite panes became opaque.

He raced below and checked his generator panel. Undoubtedly there was a powerful magnetic field all about the ship. He donned a space suit and mounted to the upper lock. When he slid back the outer door, he was almost smothered by the fall of incredibly fine metallic dust. But he shook it off and climbed out on the roof of the ship.

Nothing in his short young life had prepared him for the spectacle that greeted him. Beneath his feet the *Klondike* appeared like a huge frost-covered watermelon. All about him, illuminated by the beam of the searchlight, was a wan fog through which fell a silvery rain of almost invisible fineness.

He stooped and tried to pick up a handful of the star-dust at his feet. But as he lifted his hand, the powder slithered out like smoke caught in a gale. It flew back to the magnetized hull. He noticed that the surface was pock-marked with tiny craters. Even as he looked, a fragment the size of a ping-pong ball whizzed past his head and embedded itself in the silvery dust.

Before Neil went below, he gathered up a bucketful of powder from the floor of the space lock. He and Jim Hathaway analyzed it in their assay booth. It was the same substance that formed the larger Draconids.

Inside the ship there was no way of knowing how thick the adhering matter had become. Usually they would feel the light pattering as they cruised through some thicker portion of the meteor swarm. But that was punctuated at intervals by the heavy jar of some greater chunk hurtling through the void.

At the end of the third day Neil led his men to the space lock. Before they had slid the outer door open two feet, they were half buried by the avalanche from above. Working with scoops and buckets, they had to clear the lock and get the surplus comet debris into the cargo blisters.

The crust on the ship was a couple of yards deep. Neil realized that by the time the *Golconda* reached them, he and his crew would be hopelessly imprisoned in the nucleus of a fast growing body, adding shell upon shell to itself, like the layers of an onion. He was reluctant to cut off the generator, but this was getting to be too much of a good thing.

Outside the ship, he tried to cut back around the space lock. He had to send some men to clear away the openings of the rocket jets. But the dust was so powerfully gripped by the magnetic field that it acted as if it had been saturated with heavy glue. Even when they succeeded in loosening a shovelful, it flew back the moment an effort was made to move it.

Neil left the men struggling with the outer crust and went below to the cargo blisters. He clambered over the old mining equipment that filled them. Thoughtfully he stared at the sectional tubing of the old Saturn extension trunk. Then he called Jim Hathaway.

HE had found the dismantled shaft his father had used to penetrate the soupy top-soil of Saturn to get at the silurium deposits. The sections were each six feet long and about three in diameter, the ends flanged inward so the segments could be bolted together. Inside were cross pieces that made a ladder when assembled.

It was a troublesome job to adapt the first of the segments to the frame of the space lock door, but they managed it. Adding segments above was simple. By the time they knocked off for the day, eighteen feet of trunk led up through the accumulation of dust and gravel.

"Looks like the funnel on an ancient steamship," Neil grinned at Hathaway. They stood on the topmost rung of the ladder and hung over the top, looking down at the shining hull. "But it gives us a way to get in and out. There's enough on here for the night, so let it rain."

The next day, Neil found the level of the cosmic dust almost to the top of the extension trunk. He made it routine to add another segment every eight hours.

Trying to compute the total amount of his haul, if weighed on Earthly scales, he whistled in astonishment. If they could lay it down at the Assay Office, it would be the most tremendous fortune in the System!

By the time television contact had been made with the approaching *Golconda*, the *Klondike* was buried ninety feet deep within a shell of iridium dust.

"Where are you?" Sam Bowen asked, from the television screen in the *Klondike's* cabin. "My graviscope says you're within a few miles, but I can't see you. I found a swell little asteroid, though. Looks like silver."

"Okay," acknowledged Neil with a chuckle, as he realized what the *Klondike* looked like from a great distance.

"Land on it. I'll meet you there."

When they heard the final braking blast of the *Golconda,* Neil and his men climbed topside to greet the other crew. Sam Bowen stared at the men clambering out of a hole in the ground.

"What happened?" he yelled. "Where's your ship?"

Neil pointed down. "You're aboard it. We've been gathering ore while we were waiting for you."

He led Sam to the head of the Saturn trunk and showed him the lights of the cabin glimmering nearly a hundred feet below. Sam's eyes went round with astonishment.

"Hey!" Sam gulped. "If we land this on Earth, we're rich! Exploitation will be ruined!"

"Just about," agreed Neil grimly. "Their mines on the outer planets won't be worth a dime a dozen. Not with their low grade ore and that long haul!"

THE *Golconda's* blister hatches were open, the magnets cut off. Madly the two crews began shoveling the rich dirt into the holds.

Just before the *Golconda* was ready to shove off on her Earth-bound trip, Neil called Sam aside.

"Here's a ball of money, all right. But getting it in is going to be a bigger job than I figured on. I'm out of control already. I don't dare blast a jet. It'd backfire and wipe us all out. The *Klondike* is practically a celestial body. We're set on this orbit. For the next four months everything will be swell—until we pass the other node. After that, it's outer space.

"When you get in, charter some freighters to help you cart the stuff. There are only a couple of hundred feet more of this Saturn trunk. When that's used up—Well, you can see for yourself that we can't afford to grow too big."

"You won't grow so fast now," observed Sam. "Think how much more volume it takes to add a yard at this diameter."

"And think how much more mass I'm getting all the time! It adds to the pull. By the way, when you cash in on this load, drop by the Systemic Stock Exchange. Sell short every share of Exploitation Common you can margin."

Sam Bowen gasped. "You certainly believe in shooting the works, don't you?"

"Why not? This is beginning to look like a one-shot proposition. I expect to get more fun out of chopping down that skunk Horvick than out of the money."

"Maybe so," admitted Sam. "But Horvick won't take it lying down. Our dads were pretty foxy, and he cleaned 'em every time. I'm with you a hundred per cent, but he's got me plenty worried."

"Trot along and dump this load. I'll do the worrying while I'm waiting for you to come back. If Horvick tries some funny stuff, I should be ready with the answer."

During the eight days that the *Golconda* was absent, the newly formed "Klondikoid," as the men called it, grew another hundred and fifty feet in radius. It was fast becoming an imposing member of the Solar System. Though it was intolerably hot below, since the hull radiation had been shut off, Neil kept his generator running. The men could take turns on the topside, but the gathering of the iridium must go on.

When the *Golconda* did return, she returned alone.

"Eight million sols!" Sam shouted ecstatically, waving a sheaf of papers.

He told of his descent to the skydocks of the Assay Office, how he slid his cargo into the appraising vats, and the assay report. The metal was pure and easily separable by the swift D'Orgmenay process. The worthless iron was washed away, leaving the fifty-three per cent remainder, which proved to be all metal of the platinum group. There was also about half a bushel of small diamonds to each ton of dust.

"Fair enough," grunted Neil. "What luck did you have chartering ships?"

SAM'S face fell. "Horvick was at the Assay Office when I landed. He nearly had fits when he saw what I'd brought — wanted to know where we were poaching. He had a catalogue of every known body in the System, said they owned all of 'em that had any valuable minerals."

"Yeah?"

"Well, I just said his catalogue needed revision. But when I got out to

Sidereal Sky-docks, I found he had taken options on everything that could get off the ground. He must have had a hunch. Anyway, none of the shipowners could do business with me."

"You poor fish!" Neil said. "I'll bet you tipped your hand by selling his stock first."

"What was wrong with that?"

"Never mind. The eight million wasn't so bad. Shake a leg now. Get in with another like it."

Neil smothered his disappointment. A dozen ship loads, more or less, would not more than dent this spheroid. Getting this aggregation of metal to market was going to be a major operation, like towing in an asteroid. But there was plenty of time to consider that. They were still more than a month from perihelion.

After the *Golconda* had disappeared Earthward, Neil and Jim Hathaway took stock of their situation. There were seven sections of the Saturn trunk still unused—enough to last at the present rate of growth until the *Golconda* returned. The second day, however, they ran into a cluster of heavier meteorites and had to add two segments within eight hours.

"This is getting out of hand," said Neil.

He ordered the generator cut off. It made no difference in the rate of accretion. The hull of the *Klondike* and the surrounding shell of forty-seven per cent cosmic steel had become permanently magnetized by long soaking in the strong field of the electro-magnets. The dust and gravel continued to land.

Neil went daily to the topside, to check his position and watch the falling stardust. As he stepped out onto the pock-marked surface of his synthetic planetoid the day the *Golconda* was due, he gave his usual glance at the Sun.

Around the flaming globe was a magnificent halo of pale light and several parhelia of greenish tinge. Haloes and parhelia in space? There must be an atmosphere of sorts here. He looked at the sky back of him. Another pale, shapeless area of light marked by a solid black spot, glowed diametrically opposite the Sun.

He looked from it to the Sun and back again. The dark hole was obviously a shadow thrown by the "Klondikoid." But a shadow set off from a luminous sky was an absurdity in the void. The amazing sight held him, despite the constant hazard of the missiles flicking about his feet. The sky away from the Sun was taking on a brighter tone. He saw that the brilliant part was roughly annular, covering nearly half the field of his vision. It was not until then that he noticed its source.

Like snow whipped by a gale from the crest of a drift, powdery metal of almost molecular fineness was flowing along the tangential rays of the Sun that swept the shadow edge of his planetoid. Rather, they were flung away in vigorous straight lines, as moonbeams fall. The light pressure was tearing at the finer particles and sending them flying into space! That vague light must be visible for untold miles!

NEIL'S heart thumped at the full realization of his position. His *Klondike*, buried beneath him, had reassembled the ingredients of the scattered Jenkins 368. That ancient comet had been reborn. The incredibly fine dust hurtled along by the light waves of the Sun was its new-grown tail! Then the halo and parhelia Sunward must be the illuminated other edge of the debris stream.

He made sure of his observations, then scuttled down the trunk and ran to the televisor to call the *Golconda*. Seconds seemed hours before he succeeded in raising the anxious face of Sam Bowen.

"How far away are you?" he demanded.

"Pretty close—about half a million miles," responded Sam. "But what about the comet? Is it anywhere near you?"

"Near me?" yelled Neil. "Hell, I'm it! What do we look like?"

Bowen shook his head.

"I can't make you out yet. But there's a fine bright head, about ten degrees toward the Sun from where I think you are. The fanciest thing you ever saw in tails is running straight the

other way for millions of miles."

"That's all I want to know. Hurry down here. I'll let you have a ringside seat—smack on top the nucleus!"

Ten hours later the *Golconda* was resting on the *"Klondike."*

"Too bad you can't see yourself," Sam said. "From a distance it looks like you were melting, being blown straight down to the nadir of everything."

"One way to get comet experience," grinned Neil, "is to build one. Or rebuild one. But how did you make out with your last load?"

"Same price. I caught 'em with a posted price, and they had to pay it. But they took the sign down while I was there. Said the next lot would have to be cheaper. Same with the diamonds. Down at the Stock Exchange, I ran into Horvick again. He's sore as hell, shouted that we're riding for a fall. His stock flopped twenty points as soon as I was reported landing at the Assay Office. But I sold some more. We're over a million shares short now."

"Good work. Next time you go in, make a deal with Ecliptic Salvage Company for space tugs to pull me in. That's the only way we can do it."

"Phew!" whistled Sam. "That runs into money. Pop and I dragged a little asteroid down to Mars one time. The tugmasters collected a million sols a day."

"So what?" demanded Neil. "You've already collected sixteen millions for a few parings off this ball. Even at a tenth the selling price, we can't lose."

THE day after the *Golconda* left, they ran into a fresh cluster of meteorites. Neil and his crew coupled on the last segment of the Saturn trunk —and two others they improvised out of sheet metal. The second day there was no choice but to move onto the topside and set up a space camp. They brought up provisions, air flasks, batteries, and material for a screen against the falling meteors. They made ready for a siege against the rigors of the void. Neil was not particularly surprised, a day later, to see the oncoming lights of a group of space ships. The leader probed downward with his searchlight, landed, and the space lock opened. Helmeted figures approached, the foremost one carrying a metal tube.

Exploitation had come to take over.

Jim Hathaway drew his space gun suggestively, looking at Neil.

"Take it easy," said Neil. "This bandit robs with the Law behind him. That's the weapon we'll use this time. His own racket—in reverse!"

"Which of you is Neil Allen?" It was Horvick's grating voice.

"I am," answered Neil. "And I order you to leave my ship at once."

"Your ship?" snarled the other. "We passed it yesterday. That will be the last load you get away with. Here is the proclamation. Now take your men and get out!"

Horvick flung curt orders to his flagship captain.

Neil turned to the commander of the Space Patrol who had landed with Horvick.

"I appeal to you in the name of the Law. This man has no right to put me off my ship into the void."

"Another space-bug," sneered Horvick, tapping his helmet. "You'd better take him in, Captain. Turn him over to the psychopathic division."

The captain led Neil, protesting his rights, into the police cruiser. Jim Hathaway was cursing vigorously, but Neil silenced him with a nudge. He had just overheard Horvick issue orders to have a fleet of space tugs sent out.

"This comet is pure stuff. We'll tow it in just as it stands. What a haul!"

Horvick was pleased with himself.

* * * * *

THE day the group of tugs hauling the Jenkins comet was reported, the field west of the Assay Office was crowded. The whole population had turned out to witness the unprecedented landing of a comet nucleus on Earth for smelting. On a balcony of the Government Building, Neil Allen also stood watching the handling of the silver spheroid by the Metal Trust tugs. With him, besides Sam Bowen and Hathaway, were an astronomer, an astrogation engineer, the judge of the Court of Interplanetary Equity, and the High Commander of the Space Patrol.

The glittering ball was eased down until it was a scant three thousand feet above the bins beyond the Sky-docks.

Eight tugs hovered about it, gripping it with their magnetic rays. The time had almost come for the nethermost pair of tugs to let go and get out from under. Neil was talking to the man beside him.

"It's nothing but dust, finer than the finest flour. All that holds it together is the residual magnetism in my ship. In a moment you will see what I mean. The attraction was sufficient to hold it together in space. It's comparatively nothing here in the face of Earth's gravity."

The two lower tugs began moving out. In another moment they would cast off and dart away. The comet was a thousand feet up, lowering gently.

"Piracy is a grave charge," observed the judge. "If your contention is correct, Horvick must pay you five times the value of ship and cargo. He may be liable to a prison term besides. I trust your complaint is not a frivolous one. It will cost you dearly if it is."

A tremendous gasp, like a rising breeze, broke from the crowd. The two tugs were free, sliding away to the sides. From the bottom of the silvery sphere, tons of shimmering powder cascaded to the ground. No longer held back by the magnetic grip of the tugs, Earth's gravity now had hold of it, ripping it away. For a moment, nothing could be seen but the cloud of metallic dust, surging upward in recoil as the scintillating rain struck the ground.

The crowd pressed frantically back to escape the torrent of iridium dust. But even in their anxiety, men kept their faces turned skyward. The rumor had spread that Neil Allen had accused Horvick of robbing him of his ship and cargo in the void. Horvick had sent Neil back to Earth under guard, charged with lunacy. The Metal Trust had few friends in that throng.

"There she is!" cried Neil triumphantly.

IN the field the crowd was cheering wildly. In mid-air, where a moment before the "comet" had been, hovered the rusty old *Klondike,* a few hummocks of stardust still clinging to her sides. Thirty thousand witnesses had seen the veteran ship drop her cargo into the bins of the Assay Office. Now she was in plain sight of all, firmly held by the grapnels of the Corporation's tugs.

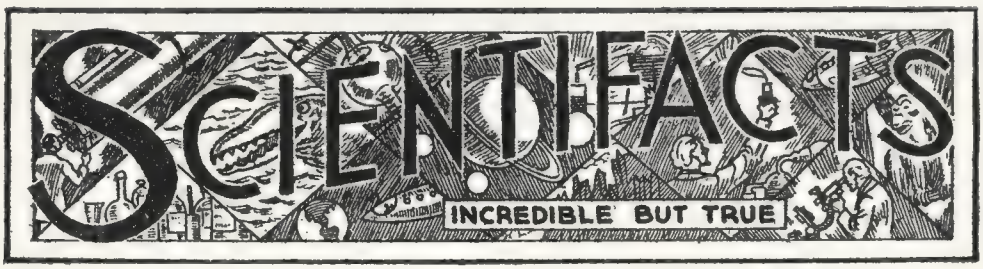
Exploitation had been exposed at last. Here was piracy, and no man could deny it.

"This'll break Horvick and his company," observed the astrogation engineer.

"That's what I figured," said Neil happily. He patted the book he had almost worn out on his trip down the comet orbit—the "Revised Statutes of the Spaceways." Then he spoke soberly to Sam Bowen. "I guess this squares things for our dads. Too bad they're not here to see it."

"Maybe they are," said Sam, with a gulp.

Next Month: MAN ABOUT TIME, a Complete Pete Manx Scientifun Novelet by KELVIN KENT



A SPECIAL FEATURE OF INTERESTING ODDITIES

by MORT WEISINGER

THE MARVEL METAL

A POUND of aluminum wire costs half a million dollars!

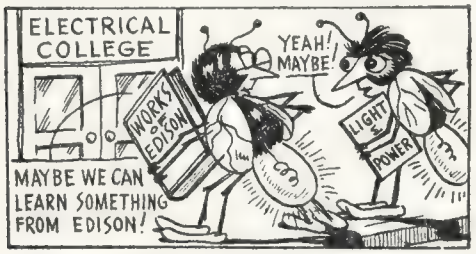
Engineers recently manufactured a pure nickel tube smaller than a human hair in diameter. Probably the smallest metal tube ever made, it measures twenty-six ten-thousandths of an inch in diameter, with the hole one-third this width.

But the slenderest metal job yet achieved is an aluminum wire, which has been drawn out to one ten-thousandth of an inch in diameter. Used in galvanometers and other delicate instruments, a single pound of this wire would stretch twenty thousand miles and cost half a million dollars!

EXPENSIVE LIGHT

THE firefly is Nature's luxury insect!

Man is much more efficient than Nature when it comes to producing artificial light. According to a report from the Smithsonian Institution, generating light in the firefly's fashion would



be a wasteful procedure for man.

A steadily glowing firefly six feet in diameter, on the ceiling of a room nine feet high, would give ample illumination for reading or drawing on a table three feet high. Our engineers cannot be impressed by this achievement. A whole fieldful of fireflies would scarcely illuminate a single room adequately, for the insect generates on an average only twenty-five thousandths of a candlepower!

ECLIPSES MADE TO ORDER

CHRISTOPHER COLUMBUS was the first Connecticut Yankee!

We are all familiar with the success story of Mark Twain's hero in the book, "A Connecticut Yankee at King Arthur's Court", wherein the hero was able to save himself from the stake by predicting an eclipse.

There's nothing new under the sun, even if it is eclipsed, it seems. For Christopher Columbus actually pulled the same stunt attributed to Twain's fictional hero. An eclipse of the moon occurred on February 29, 1504. Columbus was at Jamaica. He had been having difficulties with the Indians. They had consistently refused to give him food. Famine was imminent and his fertile mind conceived the idea of predicting an eclipse which his Zacuto almanac assured him would happen.

At the appointed time the eclipse took place. Howls arose and the Indians begged Columbus to stop the event, promising him food in abundance. And, obligingly, Columbus turned off the moon.

TOWERS OF PISA

AN apple dropped from atop the Empire State Building will not fall straight down!

Any object dropped from the top of one of Manhattan's skyscrapers will not continue straight down in a direct line, but would swerve to the East and hit the pavement about five inches to the east of the building wall.

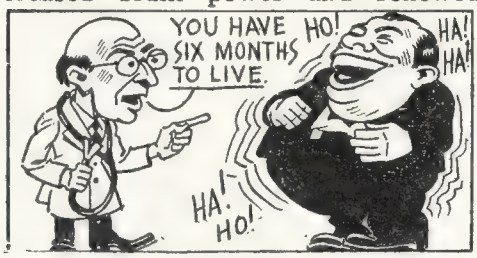
It's all due to Mother Earth's perpetual rotation. The apple's horizontal velocity of rotation makes it veer off in the direction of the Earth's ro-

tation toward the East. The amount of this deflection in inches at the ground level depends, of course, on the time taken by the object in falling. And, with the height of the Empire State Building to consider, that takes plenty of seconds!

LAUGH—AND LIVE!

LAUGH—and you will live longer! That's a real scientifact, according to Dr. Edward Podolsky, prominent health expert. A hearty laugh aids in digestion, causing a pleasant disturbance by stimulating the vagus nerve which extends its influence to all the digestive organs. Laughter increases the flow of saliva and makes it easier to digest starchier foods.

Laughter also brings about an increased brain power and renewed



mental endurance by quickening the movement of the blood through the fine and delicate vessels which permeate the brain's structure. Laughing also helps circulation and respiration by expanding the lungs with air and drawing off the blood from the veins of the heart. That's news for Father Time to laugh off!

TIME ON YOUR MIND

THERE is a clock in your brain! Scientists at Princeton report a mental clock that works while you are asleep, counting the minutes until such time as it reacts to bring you back to full consciousness.

This brain-clock, they say, sends out electrical waves that might be compared to the ticks of the old-fashioned pendulum clock. Only the clock in our brain is fast — investigators found that it ran about an hour fast in every twelve hours!

In experiments conducted, the subject was sleeping calmly (the brain waves scratched on the recording tape being short and regular) when the observers noted that the subject subconsciously sensed that a tone signal was to be sounded.

Every thirty seconds—but two and a half seconds before the signal was actually given—the brain of the sub-

ject emitted a burst of waves of the same type as the actual response. The subject's brain, then, had counted off the thirty seconds from the last signal to the next one—thus proving that there is an electrical clock in the brain which can keep time even while the body is asleep!

SUBMARINE SPIDERS

THE spider is the world's wizard diver!

The female water spider is one of Nature's most remarkable insects in its aquatic powers. It can stay under water for days, even being able to raise her young in H_2O.

The spider accomplishes this startling feat by spinning a broad air-proof web or sac which she fastens between the stems of under-water plants. She fills this sac with fresh air by carrying down air bubbles from the surface and releasing them in her submarine chamber. And in this hide-away she lives a leisurely life secure from intruders, traveling to the surface for air only when the need arises.

THIS INCREDIBLE WORLD

MINED in Canada, polonium is one of the rarest of elements, valued at $2,000,000 an ounce. . . . The known unmined supply of bituminous coal in the United States is enough to meet normal demand for the next 2,000 years. . . . The human eye, say vision experts, is about 10 times more alert than the nose. . . . If it weren't for a layer of ozone, about 30 miles up, that surrounds the Earth's atmosphere, the deadly part of the sun's ultra-violet radiation

would cause all animal and plant life on the Earth to wither and die. . . .

Man cannot live without oxygen, but oxygen in pure form can kill animals. . . . In dice games, the large numbers usually show up more frequently than the small because the numbers are made by cutting holes in the dice faces and the large-number faces therefore have less weight and are most apt to roll to the top when the dice are thrown. . . . Mercuric salts are the most powerful of all antiseptics—one part in 2,000 killing all known bacteria. . . . A certain species of East Indian insect can be heard two miles away, although it is only two and a half inches long. . . . When we purchase ten gallons of gasoline we are obtaining the power equivalent, if expressed in terms of a reservoir of water elevated 100 feet, of 1,800 tons of water occupying nearly 60,000 cubic feet of volume. In proportion to its size, the foot does more work than any other part of the body. . . . Great Salt Lake is a remnant of a lake once 300 miles long and 1,000 feet deep. . . .

If you want to reduce the easy way, go up the Eiffel Tower. You'll weigh at least a fraction of an ounce less up there, because the Earth doesn't pull you so hard. . . . Stratosphere liners of the future will have giant propellers because propellers at high altitudes revolve slower, thereby losing their "bite". . . . It is so cold on the planet Neptune that mercury would make good metal for hammers. . . . There are 80,000 different kinds of insects in North America, 10,000 of which can be classified as pests. . . . The centrifugal force of the Earth in its orbit would snap a steel cable 5,000 miles in diameter. . . .

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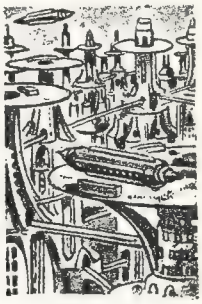
Next Month's Complete Scientifiction Novel

Visit the Fair of the Future



Wonders of the Thirtieth Century!

THE WORLDS OF TOMORROW

By MANLY WADE WELLMAN

●

"I Talked with God"

(Yes, I Did—Actually and Literally)

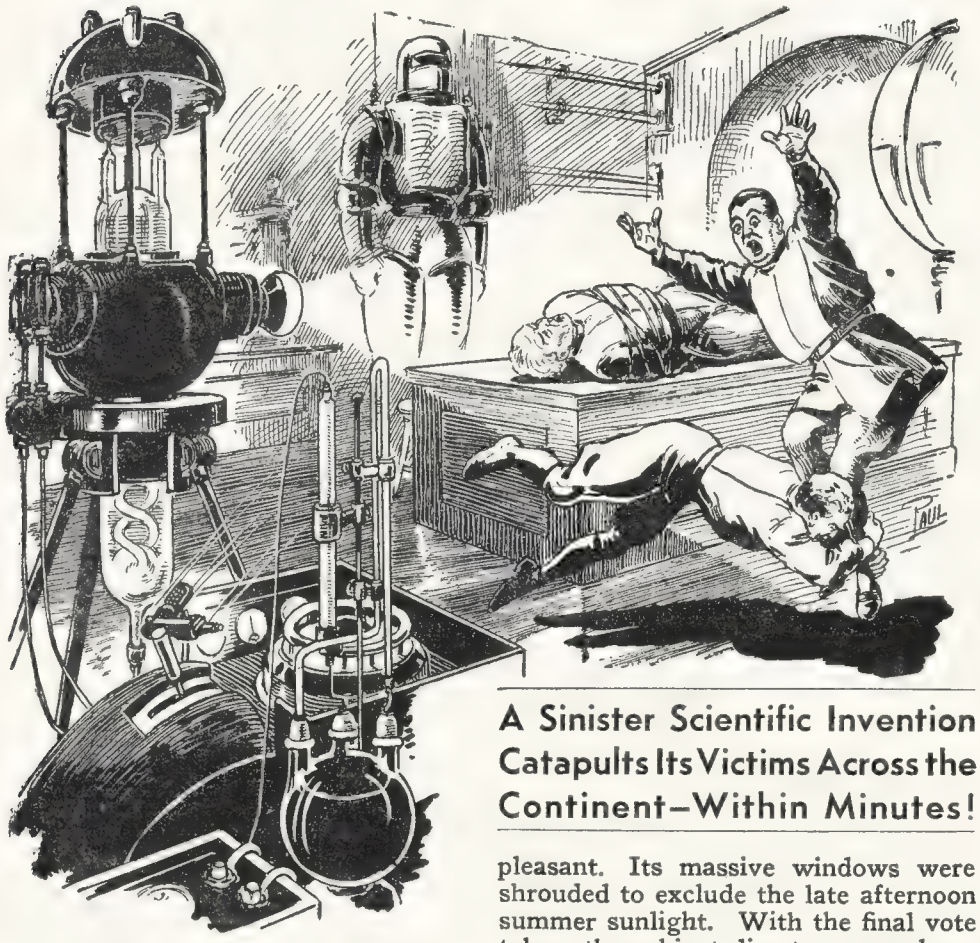
ıd, as a result of that little talk with God some ten ears ago, a strange new Power came into my life. fter 43 years of horrible, sickening, dismal failure, is strange Power brought to me a sense of overhelming victory, and I have been overcoming every ıdesirable condition of my life ever since. What a ıange it was. Now—I have credit at more than one ınk, I own a beautiful home, drive a lovely car, own newspaper and a large office building, and my wife ıd family are amply provided for after I leave for ıores unknown. In addition to these material bene-'s, I have a sweet peace in my life. I am happy as ıppy can be. No circumstance ever upsets me, for I ıve learned how to draw upon the invisible God-Law, under any and all circumstances.

You, too, may find and use the same staggerin Power of the God-Law that I use. It can bring you, too, whatever things are right and proper f you to have. Do you believe this? It won't cost mu to find out—just a penny post-card or a letter, a dressed to Dr. Frank B. Robinson, Dept. 397, Mc cow, Idaho, will bring you the story of the mc fascinating success of the century. And the sar Power I use is here for your use, too. I'll be glad tell you about it. All information about this expe ence will be sent you free, of course. The addre again—Dr. Frank B. Robinson, Dept. 397, Mosco Idaho. Adv. Copyright 1939 Frank B. Robinson.

THE VANISHING MEN

By RAY CUMMINGS

Author of "The Thing from Mars," "Secret of the Sun," etc.



It was a ghastly, frenzied moment for Wils as he fought before the invisible ray

A Sinister Scientific Invention Catapults Its Victims Across the Continent—Within Minutes!

THE twelve cabinet directors of the Audiphone Company of America rose majestically from the conference table.

"I'm very glad that you have sided with me, gentlemen," the thin gray-haired president said. "That merger really would have been ridiculous."

The conference room of the cabinet, here in the A. C. A. Building in mid-town New York City, was cool and pleasant. Its massive windows were shrouded to exclude the late afternoon summer sunlight. With the final vote taken, the cabinet directors were leaving.

One of them—James Atkins, a big, stalwart, handsome white-haired man—went to the window. Idly lighting a cigar he stood gazing moodily out over the great terraced city. The dying beams of sunlight gleamed on the huge metal structures. Then, as the last of the men went out, leaving only the president in the room, James Atkins turned from the window and quickly entered a small alcove at the other end of the room. A television

lens, microphone and lights were installed there. He touched a switch and a brilliant light bathed him.

He spoke into a local transmitter.

"Clear the air on Sender Three for my two-minute announcement," he ordered. "I have the results of our decision on the merger." He waited patiently, ready to make known the awaited news.

To Franklin Grant, aged president of the important television company, the amazing thing happened so lightning-quick that he wasn't certain how much of what he saw was an actuality, and how much the product of his own startled, horrified imagination.

He was over at the door, saying good-by to several of the other men. Then as he closed the door he walked toward the little studio-alcove. The giant figure of James Atkins seemed to glow in actinic light as he faced the television senders.

Suddenly Grant stopped, and stared with stupefied amazement, then horror. The man under the television light seemed transparent! Like a ghost standing there.

The president's gasp caught in his tightened throat. And as he stared, the pallid thing which had been Atkins was fading, dissolving. For a vague instant it seemed to stagger, as though Atkins himself was stricken with the horrifying knowledge of what was happening to him. In another second the body of Atkins was only a thin wisp of smoke, like a spiral of melting fog.

Franklin Grant shook off the numbness that gripped him and rushed forward. But the television lights glared down upon nothing but empty space! James Atkins was gone!

* * * * *

A large beach in southern California was crowded with bathers on that same hot, cloudless afternoon. By the sun it was nearly three hours earlier than when Atkins had vanished from the A. C. A. studio in New York City. But actually it was just two minutes and forty-seven seconds later. Not one among the festive crowd on the beach could be located to testify to the exact time that the falling object had first been observed. Some said they had noticed a little dot, like a speck overhead. All were agreed that no passing aircraft was seen at the moment—nothing from which the object could have fallen.

BUT most certainly, from a height of at least ten thousand feet, a dark thing came hurtling down from the sky. It struck the beach, scattering the terrified crowd. But it did not claim a single life.

It was the body of James Atkins!

A few days later—this was in the summer of 1990—young John Wils, Assistant Transcontinental Traffic Director for the Audiphone Company was seated at his desk in the A. C. A. Building. The mirror-grid beside him buzzed insistently, then lighted. It was his sister Grace. She looked frightened. Her face was pallid, framed by her chestnut hair.

"John," she gasped. "I — we want you to come here, right away!"

Behind her John Wils saw the face of Wilma Plantet, Grace's dearest friend. Wilma's brother, Henry Plantet, held a big chunk of A. C. A. stock. He had once been an important laboratory worker during those trying years when television was being perfected. Henry had become immensely wealthy by contributing some of the basic patents upon which the gigantic structure of the Audiphone Company of America was reared.

"It's about Henry," Grace was saying. "He was here just a minute ago, and now he's vanished!"

She said, in short gasps, that they were in Plantet's living room. It was about nine P. M. and Henry had been with them. Then he had gone into the library alcove of the room—a recess with walls racked with his technical books. Wilma and Grace had not paid much attention to him, then suddenly they saw he wasn't there. There wasn't any exit from the alcove, except to walk through the living room. And, being seated there all the time, Grace was positive he didn't leave the room.

"He went past you and you didn't notice him," Wils suggested calmly.

But Wils himself was fast becoming uneasy. Was this another case like John Atkins?

The image of Wilma Plantet

crowded on the television screen.

"He didn't come past us," Wilma said quietly. "I'm certain. Very certain."

"Please come," Grace urged, then lowered her voice. "There's something I want to tell you—something ghastly."

Wils wasn't long in getting there. At the entrance to the Plantet home he met Carter Cone, Wilma's fiance.

"What's all the excitement?" Cone demanded. He was a big fellow and was the head of Consolidated Commercial Television, which he recently established. "I was down watching the midget fliers when I suddenly saw my name flashed on the page board marked urgent."

Cone seemed genuinely worried, but once inside he cast that somber look from his face. When the girls told him about the mysterious disappearance of Henry, Cone laughed heartily and tried to reassure them.

"We'll find him, all right," he said, putting his arms around the blond Wilma. "Don't worry."

"But," Wilma protested, "when I remember the Atkins case—"

"Don't be silly," Cone soothed her. "It isn't."

But it was!

WITHIN a minute the audiophone in the living room buzzed. It was for Wilma, but Wils answered. It was the police of San Francisco. The body of Henry Plantet had been found dead on a roadside just outside of town! Not more than five minutes ago!

"You're crazy," Wils said. "Henry Plantet was here in New York City, fifteen minutes ago."

"The identification signature on his forearm looked genuine," the officer said. "We haven't had time yet to check his fingerprints and measurements. Look here, I'll switch you out to the body. You can have one of his relatives make the identification."

Carter Cone and Wils herded the girls back from the receiver. It was a weird scene out there in California—a little group of men huddled under a tree where a crumpled man's body was lying.

"I know Henry Plantet very well," Wils told the police officer, a catch in his throat. "Give me a close-up."

Cone and young Wils stared blankly. It was Henry Plantet—or if it wasn't, it was someone who looked so much like him that no living person could have told the difference. Then they heard the details. The body was still warm. Death evidently had come only a minute or so before he was found by a passing motorist. The body was broken as though by a fall; the tree branches overhead were smashed.

"He must've been climbin' in the tree an' fell out," the officer explained. "The fall is what killed him—but if a body ever got smashed up like this by fallin' fifty feet, I'm a motor-oiler."

It was Henry Plantet. It was later checked and verified beyond any doubt. At nine o'clock he had been in his library in New York City. Ten minutes later he had fallen out of, or down through a tree, and killed himself out in California, three thousand miles away! Killed himself? Carter Cone and Wils discussed it with blank, numbed amazement. Had Henry Plantet been able to do that? By what scientific phenomena could a man transport himself three thousand miles in a few minutes?

Later that evening John Wils sat back in his office, still wondering. The newscasters were blasting the news now. The air reeked of it. Had Henry Plantet — research television technician—discovered some scientific means of transporting human beings at such a speed? Had he been experimenting—with James Atkins, perhaps —and then been mad enough to try the thing on himself, and had met his death in landing? They were crazy thoughts.

Wils had a vision of Henry's body hurtling through space like a rocket bomb hundreds of miles a minute—and crashing violently as he landed. Idiotic perhaps, but how had he gotten out of that alcove without being noticed? The thing was a fact. Not magic; and so it had to have a scientific explanation. . . .

"Working tonight, Jimmy?" Wils asked. Three of the television company's young technicians were passing his office door, going into Planetet's laboratory across the hall.

"Orders to finish Mr. Plantet's

cathod-ray tube testings," Jimmy Blaine called back. All three of the young fellows looked solemn, as though it was eerie to work among the deceased's things.

The room's single door closed upon them. Wils turned back to his routine work, checking and recording the varying loads on the main transcontinental senders. All of the outlets and receivers, everywhere in the country, were running heavy. The strange mystery of James Atkins, and now Henry Plantet seemed to be making millions of people want to call their friends to discuss it.

A SOFT step sounded behind Wils. It was his sister, Grace. There had been so much commotion at Plantet's home that she had been unable to see him alone. Now, with poor Wilma prostrated by the shock, made comfortable for the night Grace had come to Wils' office.

"I wanted to tell you what I saw when Henry vanished," she murmured.

Plantet hadn't done the weird thing to himself; Grace was sure of it. And what she had to tell, she was afraid to have anyone else hear. She and Wilma had been seated at the center table in the Plantet living room when Grace had chanced to glance into the alcove.

"I saw Henry there," she told him. "He was standing by a bookshelf, holding a book in his hand. But he wasn't —wasn't normal-looking."

"What do you mean?" Wils demanded.

But Grace could only stammer, half coherent. The thing had been so weird, she seriously believed that it was really a trick of her own imagination. No wonder she had hesitated at telling anyone else! Henry Plantet, when she had glanced at him, had looked like a ghost. A tenuous, wraithlike, pallid figure, with the bookshelves of the further wall showing through it!

A fading ghost. She had taken only that fleeting glance—at a ghost which itself looked so startled that it seemed to stagger, clutching the book to its chest. Then it was only a little wisp of pallid outline—and then it was gone, faded into nothingness!

Wils could only stare at Grace humbly. Grant, the president had said nothing publicly about what he had seen when Atkins vanished.

Wils' mind flashed back to that televised scene, out there on the California roadside. That book had still been clenched in Henry Plantet's lifeless hand.

"Why, good Lord, Grace," he murmured. "If what you say is—"

The words caught in his throat. Out in the corridor dim footsteps were sounding. Retreating footsteps. Someone had been listening at the door.

Wils dashed out. A vague shadow was turning a distant angle of the blue-lit passage. He ran fast but the cross corridor was empty when he got there. A dozen doorways into studios and offices, most of them unoccupied tonight, showed where the eavesdropper might have fled—rooms through which he could pass into other parts of the big building. For Wils to chase him now would obviously be futile.

When Wils got back to the frightened Grace, from another doorway to the office a man was just entering. It was William Rider, Treasurer of the Audiphone Company. He was a big, six foot six fellow, about forty, and had a head of iron-gray hair.

"Oh, you Wils," he greeted. "I heard that your sister was here. I want to know if she can give any more details of that ghastly thing that happened to Plantet."

For a time the two discussed it. Wils didn't know why, but he flashed Grace a warning look. She said nothing to Rider of the ghostly shape that she had seen vanishing.

"Well," Rider said at last, in his big booming voice, "there's some scientific explanation, of course. Poor Henry—a victim of his own experimental genius, no doubt. He probably tried his mad scheme on Atkins first and failed."

Suddenly, Franklin Grant called on the televisor.

"I've been looking for your sister," he told Wils. "Can she throw any light on this? She's there with you now, isn't she?"

"Yes, sir," Wils replied, "she is."

"Well, tomorrow I want her to see me." The president's thin, lined face

was grim. "She and Wilma Plantet. By God, I'm going to get to the bottom of this, Wils. Henry was working on some pretty important stuff for us—"

OLD man Grant, at least, didn't think that Henry Plantet had killed Atkins and then himself.

"And Wils," Grant added, "I understand orders were given to have three of our technicians work on Plantet's cathod-tubes tonight. Have them stop it. I want nothing in that laboratory touched. The men of the Shadow Squad are coming for an official investigation."

"All right, sir," Wils agreed. "I'll tell them."

The president disconnected. With Grace and the big William Rider following him, Wils crossed the corridor, opened the laboratory door. Too late!

To Wils it seemed that there were three ghostly, transparent shapes in the room. Then they were gone from sight. The windowless laboratory, with only this one door, was empty!

Blaine, Robinson and Jones—three of the company's best technicians—three more victims! Gone forever? Everyone thought so. But later in the night news came that the body of Blaine had been picked up by a freighter—Blaine's body, floating in the South Pacific Ocean. A little earlier, Robinson, too, had been found. His body had come hurtling down from the stratosphere over Quito, Ecuador!

And young Jones? There was an explosion earlier that night—only a few minutes after the men disappeared—an explosion in the outskirts of San Diego, in southern California. A building had mysteriously collapsed, by what was said to be an explosion in its cellar.

It was two days later, when in the tumbled ruins, portions of the mangled body of young Jones were discovered—a queerly, gruesomely destroyed body, intermingled, blended with the shattered rocks of that office building's foundations!

"Close those windows, Grace," Wils murmured. "By God, I know a lot more now about this thing than I did before."

"Oh, John," Grace sighed, "I've been so worried about you."

It was about ten o'clock at night—the evening following the day when young Jones' body was found intermingled with the ruins of the house in San Diego. Wils had just returned to the small apartment where Grace and he lived alone. Certainly, Wils realized, Grace had good reason to be afraid for his welfare.

He was one of the minor, but important officials of the Audiophone Company of America. And this plot was against the company! How could anyone doubt it? The Federal Shadow Squad men from Washington were thick as flies here now—invisible flies buzzing around; but so far their activities seemed to have yielded nothing.

And just that afternoon Franklin Grant had inexplicably vanished out of his home! Another victim never to be heard from again? Or would his body be found, reported soon from some far-flung corner of the earth? It was weird, mysterious; but Wils thought now that at least in part he understood it.

"The thing is astronomical, Grace," he was saying tensely. He lowered his voice, glancing cautiously at the apartment windows. A pedestrian ramp was close outside them, and the yellow sheen of the city was a great mounting luminosity into the distant summer night-sky.

"Astronomical?" Grace murmured.

"Yes," Wils continued. "I've been trying to figure how the thing might be done. I've just been to see old Jonathan Peterkin—you remember him? He retired from the management of the Annapolis Observatory last year. He's been making some calculations for me. It's an intricate thing, all right. No living person could figure it out with more than a general degree of accuracy.

"But we've got enough, Grace! Enough, so that undoubtedly the thing is astronomical. None of these victims were found to the east of New York. Always in general, westerly. And south-west. God knows Peterkin couldn't find anything more accurate than that. All the factors, in relation to each other are practically unknown. And the main one, wholly unknown, is that this murderer can't figure it—can't control it."

His sister was astounded by his statements.

"John, what in Heaven's name are you talking about?" Grace demanded. In his excitement Wils didn't realize that he was very incoherent. "You're trying to tell me," Grace went on, "that these men, astronomically are being flung to the west and south—"

"Of course not! They're not moving, Grace! Not one of them moved an inch!" He tried to explain it to her. "It's the earth that moves, not these vanishing men. Many people are apt to think, Grace, that a point on our revolving Earth moves only a thousand miles an hour. Any point on the equator does revolve at about that speed. But there are many other motions that have to be added to it. The Earth's forward movement in its orbit, for instance. And—"

"You mean," Grace murmured with awe, "these vanishing men stand still, and the Earth revolves under them—moves away from them at some unknown speed—in some unknown direction?"

"Exactly!" Wils exclaimed. "I figured it out that something has altered the basic material structure of these victims. Not their size; not their shape. But the inherent nature of them—so that they become a different form of matter. Then they no longer belong to our universe. They're not subject to its laws—so that there's nothing to move them along with the Earth in its flight through space—"

The audiphone on the table beside them suddenly buzzed, and turned luminous. Wils answered it.

"You—Wils?" It was the thin old voice of Jonathan Peterkin, whom he had left only half an hour before. A portion of his littered, musty laboratory showed behind him; his face was pallid, contorted with terror.

"Wils, I've learned something else," he gasped. "Something quite definite about—what we were talking of. Good God, I can't believe it!"

"What is it?" Wils demanded.

"Over the air—impossible. Even the air has ears."

"You want me to come back to you?"

"Yes. I've something to show you. I can't bring it to you."

"I'll be there right away," Wils snapped.

Peterkin's terrified face faded as he broke connection. Wils told Grace to stay locked in her room. With her white face staring after him, he went through the exit window onto the nearest moving ramp. And within a minute or two he was in a monorail express for the outlying North Westchester residential section. Peterkin's small cottage was located there, in a grove of trees on a hillside overlooking the Hudson River.

It was a swift ride, but to young Wils it seemed like an eternity. His mind flashed back to what he thought *must be the* explanation of *this* strange thing, and which Peterkin's astronomical calculations seemed now to have confirmed. An alteration of the material basic structure of these victims. He had called it that in trying to explain it to Grace.

Bentley and Adams, as Wils knew, in their famous London experiments back in 1974, had proven that all matter in our universe is built upon a basic vortex with certain vibratory characteristics. By altering them a material body would be disconnected, so to speak, from our spatial universe.

A different state of matter—to us invisible, imponderable, non-existent. But to itself—to everything else existing in that altered vibratory rate—it would still be stark reality. Bentley and Adams had not gone much further than theory, but it was universally accepted by scientists.

WILS tried to go beyond their work, to seek out that thing of doom which was now a reality surrounding him. Grace had had a fleeting vision of a wraith of Henry Plantet, had seen it fading to nothingness before her eyes. Suppose some vibratory ray from outside that room had been focused upon him. A vibratory ray of unknown qualities.

All vibrations communicate their inherent physical characteristics to any material body upon which they strike for any appreciable period of time. The fact, Wils knew, had been easily demonstrable. These unknown intricate vibrations focusing upon Henry

Plantet would alter his physical basic nature into their own fashion. They would not affect the walls of the room, because they would be only active in their shallow field of focus.

How could anyone standing outside focus so accurately on Plantet inside the house? The Grantz fluoroscope finder could do it, of course. An X-ray image of Plantet, produced through the walls of his room. That, since the Grantz discovery of 1981, had been commonplace.

Wils could envisage then, Plantet's body, and all material objects—his clothes, their contents, that book—within its immediate human-magnetic field—being altered, transformed into a different state of matter. But it would of necessity be temporary. A pendulum, artificially accelerated, reverts to normality when the alien accelerating force is removed.

Bentley and Adams proved — in theory at least—that all material particles of our universe have an inherent vibratory nature characteristic and normal to our state of existence. That can temporarily be changed—but with the force removed, gradually they will revert to their normality.

That had happened to Henry Plantet and those others. And during the few minutes of disconnection, they had not moved from where they originally were stricken. Naturally not. Nothing would move them. They would not be subject to gravitation, to inertia, or any of our other natural laws. And it was our world, our whole material universe which was moved, so that when—after varying times, because doubtless of a varying intensity of the applied alien force—finally they materialized back into their normal existence. In relation to us, their location was vastly different!

How far, and in what direction, had a point on the Earth's surface moved in those few minutes? It was an amazing problem indeed, with a complexity beyond any human calculation. The Earth's rotation on its axis; the Earth's revolution in its orbit around the sun; the sun's drift in relation to its neighbor stars; and that star-cluster itself to which our solar system belongs, drifting in relation to other clusters! And the whole material starry universe, itself doubtless speeding somewhere in the great void of space! A combination of all those movements!

Peterkin had said that for every succeeding instant of time, it would be a different curving, unknown path. Impossible to calculate. At some moments, when the angles of movements chanced to be in the same general direction and thus the velocities would be added to each other, the total velocity of any given point on the Earth's surface might be very high.

But the Earth's rotation on its axis, Peterkin thought, undoubtedly would be the greatest single contributing factor of direction, so that the bodies materialized in general to the west.

JOHN WILS' subsequent experience proved that all these deductions were correct. The diabolical apparatus which was found proved it—an apparatus since destroyed by an intelligent government as too dangerous for existence. . . .

But who would be the perpetrator of this fiendish plot? And why? Vaguely now, Wils had a general idea. Henry Plantet had been experimenting on valuable processes for A. C. A. Those three young technicians in Plantet's laboratory could have been killed to keep them from disclosing what they might have discovered there—the murderer's theft of Plantet's secrets.

But far more than that: Plantet owned more than half the A. C. A. stock. He had always opposed a merger with Consolidated Television. So had James Atkins and Franklin Grant. But with them eliminated—and the other cabinet members also—things might be different. . . .

With these thoughts pouring through his head, John Wils arrived at Peterkin's cottage. A dim light was burning in one of its lower oval windows. Wils had no idea what made him go to that laboratory window instead of to the main entrance. A premonition, perhaps. He peered cautiously in. On the laboratory floor the body of the aged astronomer was visible. He was roped and gagged, tied like an inert bundle.

Young Wils was no Shadow Squad

man. That he had been lured to Peterkin's home never occurred to him. Seeing the old astronomer like that startled him so that he flung himself through the open window like a tiger. Peterkin's eyes tried to warn Wils. But it was too late!

From the shadows an ominous figure rose up—a figure with a Banning heat gun leveled at Wils.

"Easy now," a soft voice whispered. "Don't move."

It was Carter Cone!

Cone, about to marry Wilma Plantet, had cleverly got rid of Henry Plantet. With him in command of the Plantet fortune and controlling interest in A. C. A. he needed only to rid himself of Franklin Grant to be complete master of American Television!

"I've got you," Cone chuckled evilly. "So now you're going for a little trip. You became a little too inquisitive in my affairs, didn't you? Still, the other directors of A. C. A. must be removed before my plans are complete. When all of you are gone I'll be complete master of television, do you hear?"

Carter Cone laughed bitterly, then went on.

"Then I'll be able to make enough money to perfect my pet invention if I can only find the secret of long-range effectiveness. It would give me possession of the most dangerous weapon in the world!"

In the distant corner of the poorly lighted laboratory Wils saw a strange-looking apparatus trained directly on him as he bent over the fettered body of Peterkin. Cone's diabolical ray, ready to fling him and Peterkin into eternity! But Cone had not seen fit to use it yet.

"Lie down!" Cone hissed. "I'll drill you if you don't!"

WILS took a desperate chance. It was daring, but it was his only way out. A rack of Peterkin's apparatus hung directly over him. He saw a space suit there—the one thing he needed to outwit this maniac. The light was above it, so that its shadow was on him. In the dim light, he knew that Cone would not be able clearly to see his body.

In a furious leap Wils lunged for Cone's ankles. In a blinding flash, the Banning heat gun spat its pencil-ray of death. But Cone's shot missed! And Wils' sudden leap caught him unprepared, sent him crashing to the floor. The heat gun flew from his hand.

As Cone came sprawling down on top of him, Wils heard a loud and angry hiss across the room. Cone's wild shot had hit his death machine, had wrecked it beyond repair!

Wils' senses reeled as the invisible rays struck him. The dark laboratory swayed with a dizzying swoop. Cone, too, undoubtedly realized what had happened. A cry of horror burst from him. He tried to rise up and escape; but the crashing fall, and now the swooping dizziness, were too much for him. He dropped back, as Wils desperately tried to heave him off.

It was a ghastly, frenzied moment for Wils as he fought Cone while they were bathed by that invisible ray. The laboratory room was fading—walls, ceiling, the floor under Wils turning wraithlike, shadowy. Thoughts are instant things. Wils knew it was too late for him to escape now. Even if he could lunge beyond the focused vibrations, he might not be free. It would continue—a total disconnection of only a few seconds maybe, and then he would materialize. Where? Underground perhaps—to be gruesomely mangled as his materializing body struggled to find space again in this world—at a location where no space existed!

Too dangerous a chance! More than ever now, his salvation lay in that space suit. He fought with the frenzied, confused Cone; heaved him off, and though he still clung to one of Wils' legs, the desperately planning Wils rose up, seized the apparatus and pulled it down over him. It was an Erentz pressure-compensated, power-driven space suit. He kicked free from Cone's grasp, crouched and frantically donned the apparatus. Through its visor-pane he could see the fading laboratory outlines. A wraith of a room. Unreal now. There was no reality save himself inside the bloating suit; and the inert bodies of the bound old Peterkin and Cone beside him.

With reeling senses, Wils all but lost consciousness. The laboratory was

gone. There was only a grayness, with the three of them floating together while the Earth and all our material universe sped on. . . .

A minute? Five minutes? Wils had no way of telling. But Time—inexorable, unchangeable for everything of every possible state of existence—clicked past. To Wils there was nothing but the three of them here—not moving, just fixed in space, disconnected. But soon they would materialize. And in relation to Earth where would they be?

Wils had desperately planned that he must remain passive under the focused rays. The apparatus was so close to him that he figured its alien vibrations would be more potent. His disconnection would be longer than Henry Plantet and the other victims. The Earth would have had time to get completely away, and if that was so the space suit would save him. Wils prayed that it be true. . . .

Then he was aware of distant spots—luminous, dark spots in a grayness that was turning jet black. The earth! Wils could see the giant outline of it, far down as it spread over all the lower firmament. It was just as he had planned!

He was in space, high above the stratosphere, with the great black firmament of blazing stars enveloping him. The three of them now were again subject to the natural laws of the Universe. Now they were dropping down, pulled by Earth's gravity.

Wils turned to look at his two companions through the visor-pane of the Erentz suit. It was a horrible sight—two ghastly skeletons, heaped with bloody foam! Their bodies, here in the vacuum of space, had exploded!

And as he stared open-mouthed they drifted toward him—three bodies mutually attracted so that they fell into the stratosphere in a hideous-looking huddled group.

It was almost a day later that Wils piloted himself down, guided by starlight, gently into the Java sea. A passing air-liner saw him, picked him up.

John Wils was the last of the vanishing men—the one who did not die.

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COMING NEXT MONTH

WATERS OF WRATH

A Complete Novelet of a Floating Empire

By ARTHUR K. BARNES

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PLUS MANY OTHER STORIES AND FEATURES

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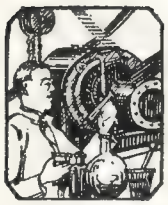


Science Questions and Answers

DUPING ROBOT-CONTROLS

Can pilots of today escape the mechanically perfect range-finding devices of anti-aircraft batteries? I think my question is a timely one, and would like to have it answered in your department.—A. D. L., Rochester, N. Y.

Airmen claim that they can evade the brain-like predictor used by anti-aircraft batteries and cannot be stopped by all the automatic gadgets invented up till now. The principal defect in AA (anti-aircraft defense) both here and abroad appears to be in the fuse, or timing mechanism of the shells. If a shell is fired at bombers 20,000 feet up, it will take the projectile about 19 seconds to reach this altitude. Obviously, if the shell explodes a second too soon or too late, it will burst more than 1,000 feet above or below the bombing planes.

Even a .25-second delay would cause the shell to pass the bombers and burst 250 feet above. AA adherents point out that modern guns can throw shells higher than loaded bombers can fly. While this may be true, whether or not the shells can be fused to explode as intended, above 12,000 feet, yet remains to be seen. Above this altitude it is apparently a matter of luck.

Even in daytime, bombers can confuse AA cannoneers hopelessly, for all their robot-controlled devices. By breaking the squadron up into elements and having each element approach the objective from a different direction, and at varying altitudes, they cause the mechanical "ears" and computors to cross each other and literally short-circuit the range-finding procedure.—Ed.

HOT WATER FREEZES FIRST

Is it true that hot water freezes faster than cold? It's pretty difficult to believe that such is the case, and I'd like an explanation if it's so—H. W., Emmamus, Pa.

Hot water does freeze faster than cold! If you take a pint of cold water and a pint of boiling water, both contained in similar kettles, and subject them to zero temperature, you will find that the hot water will be the first to freeze.

The hot water will cool very rapidly, partly on account of the rapid evaporation and partly because of the rapid loss of heat by radiation. The cold water will evaporate slowly and cool slowly. Consequently, the hot water will reach the temperature of the cold water several degrees above the freezing point, and, since a large amount will have evaporated, the smaller of the two masses will be the first to freeze.—Ed.

AMERICAN GROWTH

American statistics for the last hundred years show that the American "race" is getting taller with each succeeding generation. Is there any reason for this trend in greater growth?—B. L., Topeka, Kansas.

A study of Harvard students whose ancestors had been in America for at least two generations indicates a gradual and regular increase of one inch per generation for four generations. Similar figures have been noted for girls, at Wellesley and other colleges. And a similar phenomenon is noted in studies of various other American families.

The cause of this growth for the past century is apparently subtle and credit cannot fairly be assigned to any one factor. Nutritionists are smiling broadly and saying that they planned it that way, with better child nutrition, vitamins used liberally, etc. Climatologists, however, say that this matter of taller people in each successive generation won't continue indefinitely but that the tide will recede again as it has done before, for indirect climatic reasons.

It is interesting to note the influence on industry that the large numbers of tall people appearing is causing. Chairs are being better designed for longer legs, especially in theaters. Automobiles are already making allowances for taller people, but beds are still "standard" in length. And clothes manufacturers may have to re-examine their size distribution figures.—Ed.

TELEVISION

What is the function of the kinescope in television? How does it help create a visual image?—E. K., Los Angeles, Calif.

The kinescope is the heart of the television receiver. It consists of an elongated cathode-ray vacuum tube with a hollow glass mushroom at one end. The underside or flat surface of the mushroom is coated with zinc-sulphide, or another light sensitive chemical which glows when electrons are shot at it.

Operating in complete synchronization with the scanning beam of the iconoscope, the beam of electrons in the kinescope re-creates the identical image on the kinescope's fluorescent screen. These two scanning beams must maintain an absolute "lock-step" because if they deviate as much as a hundredth part of a second the image becomes fuzzy and the illusion of motion is lost.—Ed.

SPEEDING UP EVOLUTION

Is it possible to speed up the process of evolution in plants with the chemical colchicine? I think your readers would be interested in the answer.—E. H., New Castle, Penna.

Several new species of plants have been developed with the "evolution accelerator" known as colchicine. This chemical, which has been used in plant breeding work for only three years, helps man to speed up the process of nature in creating new plants. It doubles the number of chromosomes in individual cells.

Normally, this chromosome doubling might not happen once in a thousand years to create a new plant. However, with colchicine, which is merely sprayed on the growing parts of a tree or other plant, entirely new species have been created within three years.

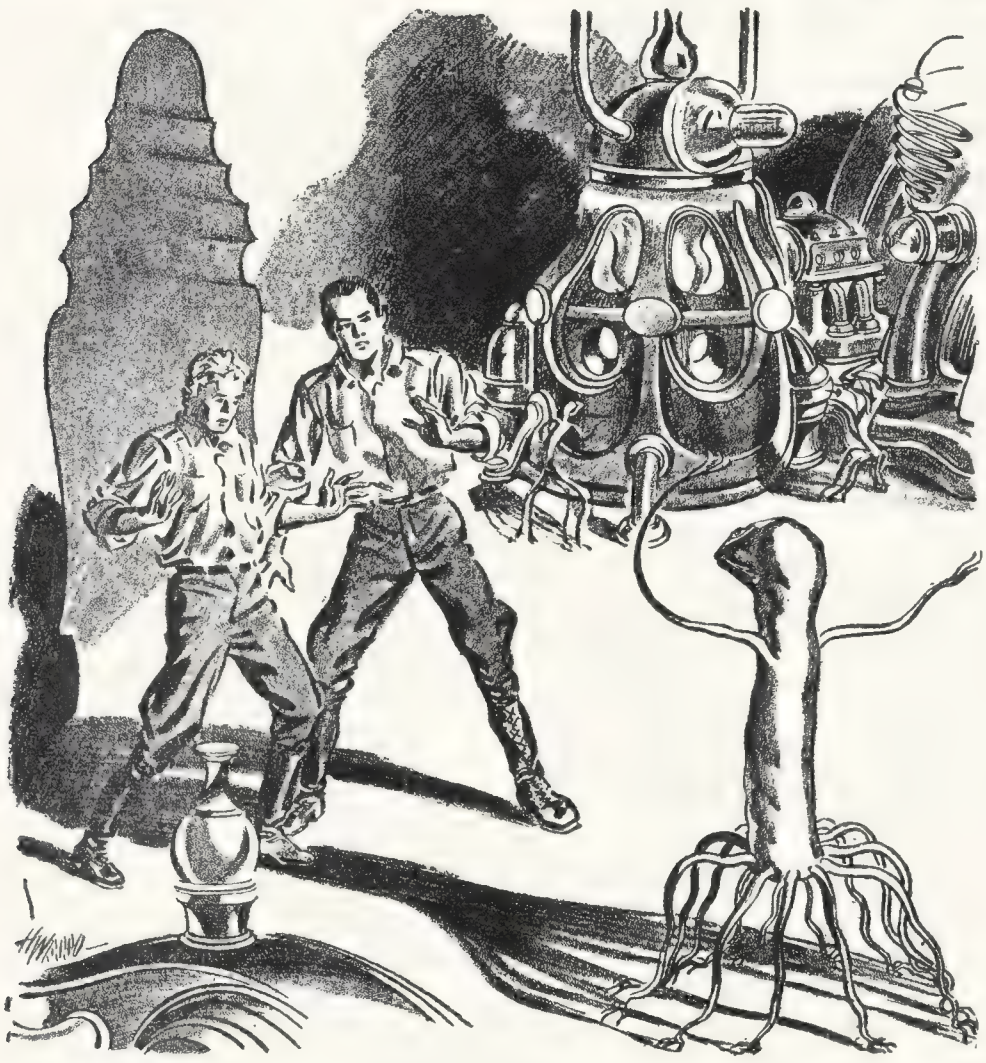
Treatment with colchicine paralyzes the process of cell division—the basic process in all plant and animal growth—long enough to keep all of the chromosomes within one cell. Thus the number is doubled in the paralyzed cells. Ordinarily the cell-splitting process causes a cleavage of the number of chromosomes too.

Colchicine has been used since the time of the earliest Greek and Aztec physicians as a treatment for gout and a few other human ailments. It is usually extracted from two plants, the meadow saffron and the autumn crocus, and is poisonous to human beings if used in large amounts.—Ed.

THIS department is conducted for the benefit of readers who have pertinent queries on modern scientific facts. As space is limited, we cannot undertake to answer more than three questions for each letter. The flood of correspondence received makes it impractical, also, to promise an immediate answer in every case. However, questions of general interest will receive careful attention.

A Complete Novelet

FORMULA



The Alien Race That Ruled the Subterranean World Was Mightier Than Man—But It Couldn't Conquer Humanity!

CHAPTER I

The Little People

JIM KENNEDY looked up from the eyepiece of his powerful microscope, stared fixedly out the window at the dreary Nebraska landscape. What he had just seen on the microscope's slide staggered his senses. It was incredible, beyond all human reason.

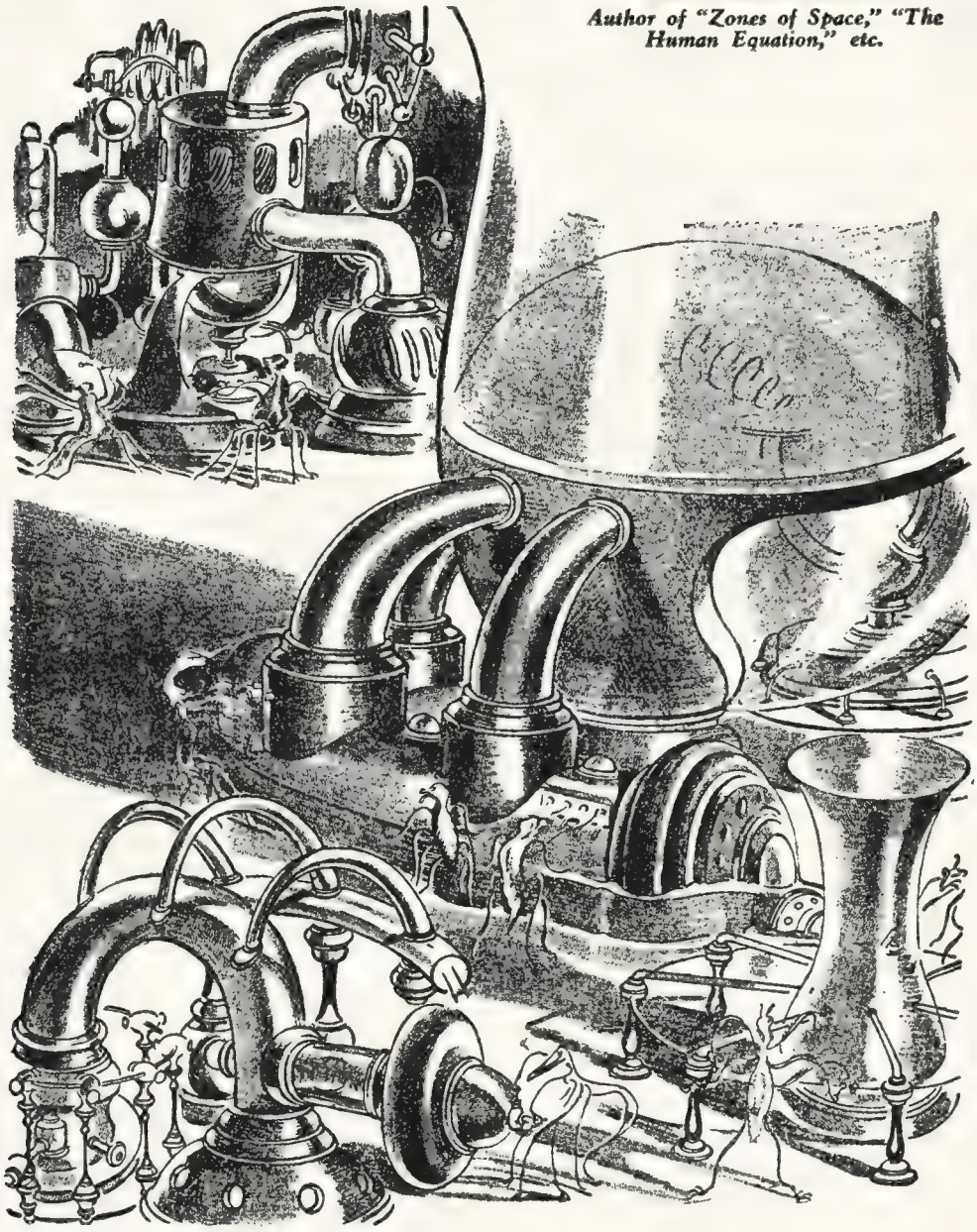
Kennedy drew a deep breath, then adjusted the focus of his instrument more carefully. He must look again. Perhaps his eyes had lied. He shifted the slide under the objective and sat motionless for several moments. Then, finally, he shook his head slowly, in profound wonder. It was true. And he was terrified.

Trembling with excitement, Kennedy lit a cigarette. The flame of the match flickered eerily in his shaking

FOR LIFE

By MAX C. SHERIDAN

Author of "Zones of Space," "The Human Equation," etc.



The huge *Cladothrix* tried to reassure the startled men

hand, illuminating a lean brown jaw that was tense from nervousness. The scientist turned his mild brown eyes at the short, stocky man beside him, Thomas Miller. He tried to keep his voice level, calm, as he spoke.

"Tom," he said in a steady tone, "you've known me for years, ever since we did research together. You don't think I'm crazy, do you?"

Thomas Miller looked up from a table littered with charts and graphs, and a smile widened his already ample countenance.

"Kennedy, my friend," he boomed in a voice an octave below the rumble of

thunder, "I am pleased that you have at last realized your shortcomings. But after all, you biologists are always crazy. Now we geologists—"

Kennedy smiled grimly.

"So you birds are the only sane ones, eh? Well, take a look through this microscope. Then have your I.Q. tested!"

Miller squinted puzzledly at his associate, then lumbered to his feet and crossed the room to the microscope. He bent down, adjusted the focus to his vision, and stared intently into the eyepiece.

A moment later he straightened up and looked at Kennedy with angry, startled eyes.

"What is this, Kennedy?" he said coldly. "Your idea of a joke?"

The biologist ignored his friend's explosive outburst.

"Tell me, Tom," he said softly, "what did you see?"

"Human beings!" Miller snapped. "Tiny — microscopic, human beings! Where did you get this slide? Is it a gag?"

Kennedy shook his head.

"No, Tom. That slide is real. I broke up one of your fossil *Daemonelix* to see whether I could learn if it were once a living animal, or simply a geological freak. That slide contains a section through a round geodelike object I found near the center of the fossil."

Miller gestured with a huge unsteady hand toward the slide.

"God, Jim—it is impossible! It can't be!"

Miller shook his huge head in utter bewilderment and looked through the microscope again, only to turn away a moment later with a baffled shrug.

"Homunculi!" he said slowly, turning the astounding revelation over in his mind. "The little people of age-old fables and folklore. God, Jim, there must be countless thousands of tiny fossil *human beings* on that slide!"

KENNEDY grinned, but his grin was a little strained.

"So the eminent geologist also pleads guilty of hallucinations?" he jibed. Then his expression changed. "Seriously, Tom, what have we found? And what are we going to do about it?"

Miller shrugged huge shoulders.

"I know only that the *Daemonelix* are fossilized spirals found in the badlands of Nebraska, Wyoming and the Dakotas. They vary from a few inches to over ten feet in length, and from a fraction of an inch to over two feet in diameter of the coil. Archaeologists at first supposed them to be the fossil casts of peculiar animal burrows, but the regularity of the spirals almost negates the possibility. Some experts even go so far as to swear the *Daemonelix* are fossil animals. We call them 'Devil's Corkscrews'."

His voice trailed off into silence and both men were silent with bewildered thoughts of their stunning discovery —countless thousands of tiny human bodies, inclosed in a cyst in a giant Devil's Corkscrew. The latter itself a prize archaeological puzzle!

Kennedy looked up, a queer gleam in his brown eyes.

"Tom," he said slowly, "just where does there seem to be the greatest concentration of these Devil's Corkscrews? Where are they the most numerous?"

Miller looked at him in surprise.

"Why, right near here, I guess. That's one reason I suggested that the Institute establish its base for biological and geological research here. Why?"

Kennedy eyed him speculatively.

"There doesn't happen to be a natural cave or cavern near here, does there?" he asked.

Miller looked at him queerly for a moment, then nodded.

"Yes," he said. "Now that you speak of it, I believe there is. About a mile west of here. Why?"

"Look," said Kennedy eagerly, "maybe these fossil corkscrews *were* animals—and maybe they still *are*—in an underground world of their own—"

"I get you," said Miller briefly. "Let's go!"

AN hour later the two men, equipped with electric storage battery cap-lamps and a hamper of food apiece, switched on their lights. With grim purposefulness they crawled over

the pile of debris that almost blocked the opening to the cavern. Soon they found themselves on the dust-carpeted floor of a narrow tunnel sloping sharply down into the depths of the earth.

"Well?" inquired Miller, stabbing an exploratory beam ahead into the darkness.

"Might as well have a look around," Kennedy said. He started off briskly down the slope, nimbly picking his way around the piles of detritus that littered their path.

Miller followed at his heels like a clumsy robot. He strained his eyes constantly in an effort to see what lay just ahead of the point where his light's brilliance dimmed to obscurity.

Slowly, gradually, the little corridor widened into a mighty cavern. Now the searchlights of the two men seemed like lone twin stars in a black cosmos.

Kennedy set off aimlessly across the vast floor. Something—his sixth sense—warned him to give up this strange venture. It urged him to return to the bleak but reassuring familiarity of Earth's surface.

Just then the sweep of his light caught the dark wall of rock to the right.

"The tunnel's narrowing down again," said Kennedy. "Maybe it's just a temporary constriction, though."

Soon the passage had cramped again to a narrow, black tubelike passage in which the sodden sounds of their steps echoed mufflledly. Suddenly Kennedy stopped in his tracks. He stood still, staring ahead several feet. The almost tangible darkness was painted a ghostly white by the beam of his lamp.

"What in the name of Heaven—" he gasped. "Look, Tom, up ahead." Miller stepped ahead and stared down the narrow passage. A cry of amazement escaped his lips. He blinked his eyes like a sleepy owl, then looked again.

Five yards down the corridor something was moving. It was moving in a way wholly alien to any method of locomotion either man had ever seen on Earth!

Miller drew in his breath.

"Jim—it's a living *Daemonelix*—a corkscrew!"

The geologist's description was quite accurate. The thing did look like a corkscrew — a rod-long, foot-thick, giant corkscrew! Leisurely, it was writhing its way up the tunnel toward them like a weirdly animated barber-pole stripe!

Kennedy stood rooted to the ground, as though arrested by a human magnet. He was searching the depths of his mind for an elusive memory which the outlandish apparition prodded dimly to life. That giant, animated corkscrew looked remarkably like something else he had seen, in addition to the *Daemonelix!* What the devil did it remind him of?

He strove to coax back that vague memory as he watched the almost mechanical twisting of the thing. Its strange spiraling as it came slowly toward them stirred the forgotten recesses of his mind.

Suddenly he remembered.

That weird caricature of life in the passage ahead was a spirillum — a spirochete! A living, gigantic copy of those tiny parasitic creatures whose detection is impossible except by the most powerful microscopes!

Kennedy sprang into alertness as a certain thought knifed through his consciousness. If the tiny prototypes of the creature ahead of them were dangerous, then this giant one was lethal from sheer size alone!

"Run, Tom!" the biologist shouted, a queer huskiness clutching at his throat.

MILLER didn't stop to ask questions. He turned and lumbered up the corridor with a speed that belied his bulk.

As if sensing the disturbance, the corkscrew creature quivered throughout its undulant length. Then, like a greyhound given the scent, it shot up the passage in lightning pursuit of the fleeing men.

Kennedy shot a quick glance over his shoulder, saw that the creature's rapid gain would make outrunning it a hopeless task.

"We can't get away," he panted. "Climb up the side and let it go by—"

The two men clutched frantically for holds on the jagged rock of the corridor wall, clambering to safety above the path of the onrushing juggernaut.

The giant microbe flashed by like a bullet turning in the grooves of a gun-barrel, its sinuous length *wooshing* on the tunnel floor, sounding like the brushes on a snare-drum.

As soon as the weird creature had sped by the two men leaped from their perches and bolted in the opposite direction with desperate haste. It was only when their lungs were burning with a fire which only rest could extinguish that they flung themselves on the ground and fought for precious air.

When they had recovered partially from their wild flight, Miller and Kennedy struggled to their feet. They cast their lights on the unfamiliar cavern walls about them, then looked at each other in utter dismay.

They were lost! They had absolutely no idea in which direction the opening to the surface might lie!

It was some time before their emotion partially subsided and reason dictated that they might far better strike out blindly than sit and wait for certain doom in these weird caverns of strange and enigmatic life-forms.

Aimlessly Kennedy started off through the gloom, casting his light in a wide arc to catch any sign of the tunnel's entry. A moment later Miller switched off his own light and fell in behind Kennedy.

Kennedy nodded.

"That's a good idea," he said, "saving your light. We'll be in the dark soon enough, even so!"

CHAPTER II

The Cladothrix

HOUR after hour the two men strode hopelessly through the vast black expanse; searching, always searching for that little opening that led back to the familiar world of Man. Hour after hour they stumbled through narrow corridors, only to see them diverge once more into chambers so huge that Kennedy's light beam found no limits.

Sometimes they struck out blindly across the expanse of the great chambers. Sometimes they followed the cavern wall with eyes straining in the determination not to overlook the one path that meant escape from this fantastic world of darkness and fear—and Things! Things so utterly different from understandable creatures of the upper world that the mind sought instinctively to discard them as mere figments of the imagination!

In places the rough walls of the cavern were sheer and straight like a mighty precipice. In others they twisted into massive spires and pinnacles, structures covered with strange fungi that painted the architecture with a myriad of eerie, lusterless colors.

By the time Kennedy's light had faded to a feeble glimmer and then to darkness, and Miller's lamp was indicating that its usefulness was almost over, the two men had long given up hope of finding the path to safety and sanity.

They pushed on and on and on. There was nothing else to do. Nothing else but to sit and listen and go stark raving mad, waiting, waiting for the gathering hordes of rustling Things in the alien ebon silence of that vast sepulcher.

Kennedy stopped suddenly and stared ahead into the gloom that slowly grew deeper as the light's brilliance gradually faded. A broad stream of limpid water was flowing sluggishly through a channel cut in the cavern floor!

"Tom," he said in a low voice. "Look ahead!"

Miller followed his gaze.

"A canal!" he breathed.

Kennedy nodded. An artificial canal loomed ahead. That meant intelligent beings, light, food—and safety from those lurking creatures of the darkness!

The sight of that seemingly man-made canal gave the two scientists a new lease on life. Though exhausted from countless hours of walking, the two men broke into a shambling trot along the path that paralleled the strange canal.

And then the lamp went out. The battery's last dregs of power had drained away. They were blanketed in unfathomable darkness.

Wordlessly, the two men groped for the reassuring touch of each other's hand in that savage blackness. And in that void came a rustling circle of sound, a circle that slowly converged upon the two men at its center. The sounds were not the comprehensible sounds of normal surface animals, but uncanny rumblings of strange enigmatic things in a fantastic environment!

Back to back the two men stood, waiting and ready to sell their lives as dearly as possible, the acrid odor of the prowling things harsh in their nostrils.

Suddenly a strident ululation tore painfully at their ears. A blinding glare of light from an unknown source leaped out across the cavern, blazing full upon a nightmare ring of waiting creatures. With frenzied haste, a dozen weird shapes scattered wildly from the probing brilliance of the light.

AFTER the last creature had vanished into the distance, the glare of the mysterious beam flashed upon the two men. Even as they stood waiting expectantly, blinded by the light, Kennedy realized that the beam came from the canal, and that its operator, who or whatever it might be, was scrutinizing them closely in its revealing glare.

Finally, as if satisfied with its findings, the light was turned from the men to the pathway paralleling the canal. For several moments it hovered there steadily while the men adjusted themselves to its strong radiance. Then the spot of light moved slowly down the path.

For a moment Kennedy was puzzled as the light returned to the path immediately ahead, then again moved slowly forward.

Kennedy shrugged, as he caught the idea. They were to follow the beam.

"We might as well trail this will-o'-the-wisp as to wander around in the dark," he told Miller and started off in pursuit of the leading beam.

For more than an hour the men followed the guiding light until they felt they had almost reached the limit of their endurance. At last, when they were certain they could go no farther, a great golden glow started to suffuse the darkness ahead. A few minutes more brought them to the shore of an apparently boundless underground lake, a lake whose depths were lighted like an iridescent aurora as far down as the men could see.

Projecting above the surface of the beautifully sparkling waters were myriads of cubicles and many-hued spires. These, Kennedy slowly realized, were merely the tops of mighty underwater structures.

"What a city!" he said awedly. "Who wants to find civilization now?"

Meanwhile, their guiding beam had hesitated for a moment at the water's edge. Now it started out across the softly rippling waters which lapped gently at their feet. Once again the light made the transit back across the lake to the shore at their feet, then started suggestively across the water toward the top of the nearest of the structures.

The two men looked at each other for a long moment, apprehensive, undecided. Then, with a dare-devilish shrug, Kennedy waded slowly into the almost tepid water and started out with swift strokes for the cubicle. Miller followed close behind with much splashing and sputtering.

They reached the illuminated cubical in safety and a panel above the water's surface slid smoothly back. Curious but reckless, fearless of the unknown, the two scientists climbed through the opening. They found themselves on a circular ramp leading down into the depths of the underwater structure. Miller and Kennedy exchanged glances, crossed their fingers, then started watchfully down the sloping walk.

A dozen steps brought them to a portal which opened into a huge room. The room was big. So big that a few of them would have held Grand Central Station. Its entire huge interior was filled with a myriad of things that made the men gasp. And above all ruled a grim hustling, bustling motion that indicated an entirely purposeful and machinelike activity.

Great gleaming masses of complicated mechanism crowded the Gar-

gantuan chamber to overflowing. They added cacophonous sounds to the bustling clamor as they fulfilled their enigmatic purposes.

Huge separatory funnels, flasks, beakers and condensers cast a wonderland glitter, colored by the scintillating hues of the weirdly beautiful liquids which cascaded through the intricate maze of apparatus, throughout the place.

BUT stranger, far stranger than any of the instruments, were the beings who controlled their operation! Before each instrument stood a bush-like being of slender branching filaments. Its delicate extremities simultaneously operated a dozen controls with a deftness and facility that would have shamed the most accomplished human surgeon!

Kennedy watched in amazement while the slender branches writhed and twisted into a variety of prehensile shapes. Each form fitted exactly the needs of the operation occupying its attention. Spatulas, augurs, chisels and ladles were not beyond the adaptive magic of those restless tentacular filaments.

"*Cladothrix!*" exclaimed Kennedy. "These things are gigantic and versatile *Cladothrix Dichotoma!*"

"Clad in which?" inquired Miller plaintively.

"It's a pleomorphic or many-shaped bacterium," explained Kennedy, still staring ahead at that fantastic scene. "One which can assume an almost infinite number of involution forms. Only I've never before seen any quite that infinite!"

"Oh," grunted Miller.

"But the really amazing thing about it," continued Kennedy "is that they are intelligently performing tasks beyond the skill of the most accomplished human technicians!"

Just then a *Cladothrix* deserted its labors before one of the more intricate mechanisms and started toward them by the simple method of sprouting a dozen cilialike legs on the base of its arm-thick stem. It then proceeded to scurry swiftly and smoothly over the onyxlike floor toward the two apprehensive humans.

The men drew back in alarm and started to retreat toward the comparative safety of the entry-way. The huge *Cladothrix* promptly came to a halt in an evident attempt to reassure them.

With slender filaments swaying in graceful soothing rhythm the strange creature started slowly across the polished floor, and the two men realized that they were expected to follow.

"It's—follow the foliage, I guess," said Kennedy, edging gingerly after the *Cladothrix*.

The creature led them down a long aisle on either side of which dozens of the magnified *Cladothrix* worked busily at their incomprehensible labors.

Once Kennedy stopped and stared with ludicrous astonishment at a monster microbe which was engaged in polishing an optical lens. Two of the bacterium's tendrils meticulously cut a piece of abrasive paper into small squares by forming themselves into a pair of shears. One tendril then sprouted several pseudopods with terminal suction cups, which attached themselves firmly to the abrasive squares.

In a moment Kennedy was treated to an excellent imitation of a parabolic flywheel as the radiating spokes with their abrasive pads revolved at high speed on the parent filament, rapidly finishing the lens to the desired optical curve.

"Whew!" gasped Kennedy when he caught up with Miller. "Talk about being versatile! That fellow would put a jack-of-all-trades out of business!"

Their guide led them out through an arch into a smaller adjoining room. This room was barren except for a frosted glass screen on one wall, and a circular pool of water in the center of the floor.

THE *Cladothrix* glided up to the screen and curled a prehensile filament about the handle of what looked like a stylus. A cord ran from its base to a small box on the wall by the screen.

Gracefully, the *Cladothrix* lifted the stylus and inscribed a perfect circle in

fluorescent green on the glazed screen. With a second stroke it drew a diameter to the circle, pointed to the circle and its diameter, and handed the stylus to Kennedy.

Kennedy immediately caught the significance. The being wanted to know whether the Earthmen understood the value of *pi,* the relation of the circumference of a circle to its diameter.

He stepped to the screen and made three dashes, then one, then four, then one and then six, spacing each group to indicate its unity. With a flourish he handed the stylus to the *Cladothrix* and stepped back.

"My round, teacher," he chuckled.

The lines on the screen glowed with a brilliant intensity for a moment, then faded entirely away.

The *Cladothrix* then traced a triangle on the area with an easy perfection that Kennedy envied, and again tendered the stylus.

Kennedy decided to abandon the dash system, and drew radiating lines from the three angles to the figure 180°. He added two right angles to illustrate further his meaning.

Again the figures brightened momentarily, then faded.

The creature pointed to Kennedy, then to Miller, and motioned toward the screen.

Kennedy hesitated a moment. Then he stepped up and printed the letters M E N.

When the letters had faded, the bacillus took the stylus, printed N M E, then glided back and gave Kennedy the stylus.

"He wants to learn his ABC's, eh?" suggested Miller.

Kennedy followed the suggestion and printed the alphabet on the screen in block letters, then printed a number of simple words and drew crude pictures to illustrate them.

After a slightly longer interval the character faded again and the *Cladothrix* once more approached the screen.

"H e y !" protested K e n n e d y. "Enough's enough. I'm beginning to get hungry!"

Receiving no tangible results from his vocal plea, Kennedy woefully indicated his open mouth with a finger and gave an imitation of an ostrich swallowing a cocoanut.

After several strenuous repetitions the *Cladothrix* got the hint and glided away. It returned a minute later with a metal disc heaped with some purple ovoids.

Kennedy eyed the offering suspiciously. Experimentally, Miller selected one of the purple objects. He closed his eyes, popped the thing into his mouth, and bit down.

A beatific expression supplanted his apprehension and his jaws went to work in earnest.

"Well?" asked Kennedy plaintively.

Miller chewed vigorously.

"Not bad," he mumbled.

Kennedy shut his eyes and tried one, then followed it with four more in quick succession. "Pretty good," he reported, smacking his lips. "But what does it taste like?"

Miller shrugged. Just then the *Cladothrix* approached and indicated that they were to return to the screen. After several more elementary questions the bacillus led them into the main laboratory.

There, they were seated in a cage constructed of interwoven gray-blue strands of wire. Fibrous helmets, with numerous electrodes attached to them, were placed on their heads. Miller eyed the array of wires which led from the helmets to a panel which bristled with strange dials and switches.

"Just like the hot seat," he remarked with a baleful glare at the slender tentacles which held him powerless. "Are they going to electrocute us?"

"I don't think so," said Kennedy. "They seem friendly." And as he had expected, nothing happened when the switch was pulled. The two men experienced no unusual sensations. A few moments later the *Cladothrix* released them and removed the helmets.

CHAPTER III

The Human Menace

WHEN they returned to the "lecture" room, Kennedy had an

idea. Picking up the stylus, he wrote on the screen:

"Are you the only advanced life-form here in the caverns?"

The *Cladothrix* hesitated for a long moment, then took the stylus and printed rapidly:

"No. The intelligent ones are the —wigglers in the water."

Kennedy gasped. If the *Cladothrix* were not the most advanced—then Man was certainly relegated to third place or worse in Earth's scale of intelligence!

"We," wrote the *Cladothrix*, "are workers. We are robots for the—for those who live in the water."

Kennedy frowned in puzzlement. Then he remembered how a light from the canal had guided them to this submarine city. That light must have been operated by something in the water of the canal.

"You are alive, though!" Kennedy wrote on the screen.

"Yes," came the answer. "But we are only—hands for those in the water below."

Slowly Kennedy was beginning to comprehend the astounding truth. He began to realize that the *Cladothrix* were in reality telepathically controlled creatures, responding to the unseen things which dwelled in the water's depths. These huge and versatile bacteria were in truth being used merely as hands by superhumanly intelligent creatures lurking in the waters below the circular pool in the floor.

Kennedy gasped. He snatched up the stylus and wrote:

"Then we have really been communicating with—you of the depths?"

"Yes," came the answer. "The *Cladothrix* has merely been conveying to you our telepathic messages, and in turn we have been receiving your communications through its medium."

"Then what are you?" asked Kennedy apprehensively, fearful of the answer that was to come.

In reply the calm surface of the water in the circular pool seethed in turmoil. A gleaming flash of silver broke the surface of the water, and a long sinuous body appeared for a moment before the eyes of the men.

"It's a fish!" Miller decided.

But it wasn't a fish. It was a seven-foot long ribbon that tapered delicately at either end. Almost at its center was a great eyelike spot that made Kennedy shiver.

"A *Trypanosome!*" he said startledly. "A huge, monstrous *Trypanosome!* It's an exact, giant replica of the one that causes sleeping sickness in human beings! The *Trypanosoma Gambiensis!*"

After the weird creature disappeared again into the enigmatic depths of the pool, the *Cladothrix* scurried quietly from the room and returned in a moment with two strange looking metallic objects.

In a moment the *Cladothrix* had fitted one on the head of each man, then turned and left the room.

"We will now communicate without the aid of my—servant."

Kennedy and Miller looked at each other in amazement.

"The—what you call *'Cladothrix'* manufactured the telepathic amplifiers after analyzing and cataloguing the type and frequency of your thought vibrations," came the explanation from deep within the minds of the two men. "We first ascertained that this move was possible by determining whether you were intelligent through the use of the screen."

Kennedy decided to find out whether this strange method of communication was reversible.

"Are you the only intelligent form of life here in the cavern?" he asked.

"Yes," immediately came the decisive answer. "There are many hundreds of different forms of life here, but we alone have advanced beyond the discovery of—*pi*—the primary symbol of civilization and intelligence."

IN return the unseen *Trypanosome* asked a question that staggered Kennedy.

"How did you two attain your great size?" it asked. "And are all the myriads of your species as intelligent as you?"

Kennedy frowned in puzzlement, hesitated, and the question was repeated.

"I do not know what you mean," he said at last. "We simply penetrated from the spherical surface of our world to this cavern. We have not gained in size. We are normal specimens of our race."

"You are—jesting!" came the incredulous reply from the unseen being. "We mean you two no harm. We wish only to know how you increased your size."

"I am telling the truth," Kennedy answered sharply. "We have not gained in size! Where did you gain the impression that we have? And how did you know there are many more beings like us?"

"Because,"—came the soul-shaking reply—"with our microscopes we have seen many millions of your species swarming in cultures, cultures taken from the bodies of our kind who are affected with a certain disease. Your species causes the most virulent and incurable disease known to our race!"

Tiny whirlpools of fire gyrated madly in Kennedy's brain. A myriad of enigmatic facts raced through his mind, challening his very reason. In these underground caverns existed enormous replicas of tiny surface bacteria and disease germs. And in the bodies of some of the huge germs thrived infinitely tiny human beings! Men in miniature who were disease germs to the monstrous denizens of the caverns! *Bacillus homunculus!*

Kennedy's mind revolted at the thought, refused to accept the hideous knowledge.

"You lie!" he cried. "You and your race are injurious, even deadly parasites to Man—not the reverse! Man is the intelligent master of a world in his own right. He is not an insidious horrible mite gnawing at the vitals of another! I challenge you to prove your lie!"

In response to a telepathic order from the *Trypanosome,* one of the *Cladothrix* wheeled a huge projecting microscope into the room. A few swift movements and it had placed a culture slide on the mechanical stage, adjusted the controls.

Kennedy and Miller watched intently as the *Cladothrix* manipulated the slide under the objective. At last a bright clear image appeared on the screen.

The two scientists uttered cries of astonishment. A horde of microscopic human beings milled about in that one tiny drop of culture under the lens of the microscope!

For a moment the tiny humans threshed about in wild confusion. Then the scene quieted and each individual began to go about some specific duty. A duty apparently as important to the homunculi as is Man's daily business on the planet's surface to normal men.

Kennedy watched spellbound as those tiny humans scurried here and there with a speed that blurred his vision. Now he remembered those tiny fossil human bodies he had found in the cyst taken from the huge fossil *Daemonelix* on the Earth's surface. He recalled the path of reasoning that had led him to explore this vast enigmatic cavern.

KENNEDY'S mind whirled along, striving to solve the horde of mysteries blocking the path of logical reasoning when he felt the *Trypanosome* sending a thought at him.

"Are you satisfied? Do you believe now?" it asked.

Kennedy shuddered and turned away from the screen and its ghastly image.

"Yes," he said. "My God—yes! But how—"

"I'm sorry," came the solicitous message from the unseen creature. "I understand how the knowledge shocks and grieves you, but what you have seen is true! These tiny 'homunculi' as you term them are more virulent and deadly than any other disease organism known to my race. They are dangerous to us because of the aggressive determination and intelligence with which they construct huge cysts in the tissues of our people affected with this particular disease.

"You see, from the time a *Trypanosome* contracts the malady, each colony of homunculi begins to enlarge a microscopic cyst until at last the 'tumor' reaches a size sufficient to cause the death of the diseased individual. And all this does not require

a very extended period of time. Under favorable conditions a colony of the homunculi will double its size every four hours!"

Kennedy gasped in amazement and again started to reply with angry words of disbelief. Then slowly he began to realize that in truth these tiny humans might indeed be ephemerae; that their life-spans must be measured in hours instead of years—Time was relative to their size!

Under such conditions the words of the *Trypanosome* were far from unreasonable. The homunculi might well accomplish fully as much in their brief but accelerated life-span as Man does in his.

Kennedy was silent while the *Trypanosome* swiftly gave him a resumé of the inception and course of the dread homunculus disease. It told of the savage inroads the deadly disease constantly made on the *Trypanosome* civilization.

It told of the endless years of research spent in attempting to find a cure. Of research which had met with hopeless failure—as have Man's efforts to conquer cancer.

It told of the new and increased virulence with which the homunculus disease had again broken out, growing within the last few months to epidemic proportions. The unseen creature painted a vivid thought-picture of a great civilization threatened with ultimate oblivion—unless some means were found to check the insidious malady.

The *Trypanosome* pleaded the cause of its people with an impassioned sincerity that stirred Kennedy to the depths of his soul. It concluded with an appeal for help in the losing battle.

"I know you may well hesitate to move in our behalf in view of your evident relationship to the tiny homunculi," concluded the *Trypanosome*. "And all I can do is to lay the life and future of a great and noble civilization at your mercy. You two undoubtedly have a knowledge of the metabolism and body chemistry of your kind. Perhaps you know of substances which would destroy the homunculi—without harming our own life processes."

Kennedy started to protest, but the *Trypanosome* continued:

"I will not ask for your answer now. Nor will I attempt to influence you by threats. You will be given the freedom of our laboratories, and cultures of the homunculi will be supplied for your study if you so desire. The decision rests with you."

Kennedy stood silently for many minutes after the *Trypanosome's* final words. At last he turned to Miller.

"What'll I do, Tom?" he said helplessly. "I'm between the devil and the deep blue sea. If we find a remedy, it means the destruction of the *homunculi*. And, Tom—they're like us—human beings. I feel sure of that!"

CHAPTER IV

Man or Mite?

MILLER started to speak, then shrugged non-committally.

"Well, Kennedy went on, "we may as well take advantage of the hospitality offered. Perhaps we can find out what our homunculi cousins are—and where they originally came from."

For several days the two men indefatigably watched and studied the tiny enigmatic homunculi under the huge projecting microscopes. Gradually Kennedy came to realize that the relationship between these tiny parasites and surface Man was horribly close. In fact, Kennedy concluded, the only very evident difference was size, and size alone!

Slowly he pieced together vague patches of theories and facts until he had constructed a logical and entirely believable explanation for the whole fantastic puzzle.

The first hint came when he recalled his finding of those tiny fossil homunculi in the cyst taken from the fossilized *Daemonelix*. Then he recalled their encounter with the *spirillum* in the cavern corridor.

His final observation came from the perfect resmblance that all the huge cavern creatures bore to the microbe pests that besieged surface Man.

Thus, Kennedy thought, if two

forms of life developed from separate and independent sources during Earth's age-long life, one form on the surface, the other in a vast bubble beneath the crust, then those two life series would conceivably follow widely divergent evolutionary lines of development.

And, if the widely variant evolutionary types by chance had wandered into the opposite environment, i. e.—if some of the surface creatures had penetrated to the world of darkness, and some of the cavern creatures into the world of light, then there would undoubtedly have ensued a degeneration of the creatures invading inimical environments!

The mighty cavern *spirilli* had degenerated over a period of a million million years in the brilliant sunlight for which they were totally unsuited. They had degenerated into microscopic creatures which sought escape from the dreaded light by invading the bodies of surface creatures.

They left the sole hint of their prehistoric form and size in the fossilized remains of the earliest invaders—which scientists call *Daemonelix.*

The huge bacilli, the *Trypanosomes,* and the myriad of other cavern creatures which also found their way to the surface, likewise degenerated both in size and in function. Only they had left no fossil proof of their former grandeur because their bodies were softer, less able structurally to survive the long process of ossification.

Similarly, adventurous Man invaded the cavern world. In turn, he also underwent an age-long period of structural degeneration, finally seeking escape from a hopeless environment by invading the bodies of the creatures who had evolved in the world of eternal night.

There was the solution! There was the explanation of the wide gap between animal and bacterial life.

KENNEDY stopped in bewilderment, awed by the vast significance of his discovery. With breathless excitement he told Miller of his deductions, told him of their unquestionable relationship to the tiny homunculi.

Then, with avid interest, they returned to their study of their little relatives. Each day brought new proof that they *were* human, those homunculi. Their lives were as full of humor and pathos, joy and sorrow, as those of their infinitely larger surface brothers!

The two men delved into the innermost secrets of those enigmatic microscopic images. They followed the careers of a thousand tiny individuals from birth to death, careers that were as full of pitfalls, of sublime success and heart-rending failure as the most dramatic of human lives!

They watched the struggles of those tiny folk to build up their civilization to new and greater heights. They watched their determined progress in the face of overwhelming odds. They saw laughter and love and sorrow blended into an incredible drama of Life!

Miller and Kennedy *lived* with those little creatures. They laughed and cried and hated and loved with those little brothers who lived out their lives in a few brief hours. And now Kennedy knew with a certain knowledge that he could never sacrifice these tiny creatures for the continued existence of an alien race of creatures whose primeval lineage was not even remotely linked to his!

Scarcely had he made his decision when he felt the intruding message of their host, the *Trypanosome.*

"Have you decided?" came the anxious query. "Are you ready to pass sentence on a mighty civilization—for life or for—death?"

"No!" Kennedy cried within the confines of his mind. "No—I cannot!"

"I do not like to hurry your judgment," gently came the answer, "but the plague is growing rapidly to cataclysmic proportions. Unless your answer comes soon, even though it be favorable, it will be too late."

Kennedy's soul writhed within him as he strove to tell the creature his answer, that he condemned them and all their potential future to eternal oblivion!

"Perhaps it would help," came the suggestion, "if you saw our civilization itself. Would you care to see the world

beneath the waters, where we live?"

Kennedy reluctantly assented, his mind in an agony of torment. The attendant *Cladothrix* brought two jointed metal suits with attached helmets, which Kennedy realized had been constructed for them by order of the *Trypanosome*. The helmets were equipped with small but intricate mechanical gills to provide the men with oxygen extracted from the water.

When they were dressed in the light but rugged suits, built to shield them from the pressure of enormous depths, the two men lowered themselves into the water of the circular pool. There they were met by the great writhing ribbon-like creature, its central eye-spot glowing weirdly.

Kennedy regarded the fantastic creature anxiously, wondering for a tense moment whether this were not but a trap to torture him into revealing the knowledge that would save the civilization of the *Trypanosomes*.

However, his fears were entirely unfounded, and as the *Trypanosome's* thoughts came more clearly to his mind, he realized that here indeed was a creature without malice.

THE *Trypanosome* turned to lead the way into the depths, and Kennedy and Miller found that their suits were constructed so that the total specific gravity of the human body and suit equalled the specific gravity of the water, and only slight motion of hands and feet served to propel them easily.

Down and down they went, with the eerie opalescent glow growing with their descent until the depths were as bright as a surface midsummer day.

"Induced fluorescence," explained their mentor. "Our bodies are as sensitive to light and images as the retinas of your eyes."

Gradually they began to penetrate to the populated centers of the great *Trypanosome* city. They saw mighty buildings founded on the lake bottom, rising hundreds of feet to the surface. They saw huge open spaces with beautiful vari-colored vegetation growing in carefully tended geometrical profusion.

They saw gigantic masses of machinery operating with a smooth efficiency that rivaled even Man's mechanical accomplishments. They saw spires and obelisks and stranger monuments—all decorated with delicately graven figures that were beautiful even in their incomprehensibility.

Kennedy wondered that the denizens of this world could continue so apparently undisturbed about their duties in the face of imminent agony and death from disease. Then, slowly, he began to catch the thoughts of those alien creatures as they went about their daily duties with a brave and beautiful contempt for the coward's fear of death.

They were thinking not of themselves, but of their loved ones—for love is not an emotion peculiar to Man alone! They thought not of the agony and death in store for themselves, but of the destruction of a great civilization; the passing of a mighty and intelligent race into the depths of oblivion!

On and on the two men followed their strange guide. Through great libraries where the aged past of the race was recorded in infinite detail. Through huge museums where all the oddities of a fantastic world were kept alive in their natural environments.

Kennedy wondered suddenly why the scientific laboratories alone were above the water's surface while all the rest of the civilization was beneath it.

The *Trypanosome* explained.

"Optical instruments function more satisfactorily in air," it pointed out. "Most chemical and physical experiments cannot be carried on at all under water. We cannot exist out of the water, but we found that the *Cladothrix* could, and eventually we developed an infinitely adaptive species which would respond to our telepathic control."

Kennedy slowly began to realize the mighty obstacles to progress which these strange creatures had met and conquered in their patient but determined advance. A new and greater respect for these alien things loomed larger and larger in his reluctant mind.

Their guide led them to institutions where countless scores of plague victims lay dying on their pallets. They writhed with a terrible agony born of those malignant cysts of tiny man-

creatures which grew in their vitals like a horrible cancer.

The two men saw great congregations of *Trypanosomes* grieving the loss of friends and loved ones, but all the while striving valiantly to carry on the work of their dying civilization. They saw the adult *Trypanosomes* caring tenderly for tiny creatures whose pitiful childish pain beat against the minds of the men in a wave of frenzied agony.

They didn't understand, those tiny creatures didn't understand that they were doomed to hours of unendurable agony and finally death—by a horde of microscopic things that built and grew within their vitals like a great malignant tumor.

Kennedy closed his eyes to shut out the sight of a mighty civilization of once-happy peace-loving creatures being utterly destroyed by the ravages of the homunculi. But he couldn't shut out the agony of those tiny *Trypanosomes*, little alien creatures who didn't understand! And at last he could stand no more.

"Take me back!" he cried aloud, and the sound pressed hard against his eardrums within the confines of the helmet. "Take me away—I want to think. I've got to think!"

BACK in the laboratory, Kennedy sat with his face in his hands.

"Tom," he cried, "do those tiny humans — the homunculi, who know not that they destroy—have more right to life than the *Trypanosomes*? Creatures so alien we have nothing whatever in common?"

"Nothing whatever," said Miller bitterly, "but love — and honor — and mercy and—"

There were a thousand reasons why both races should live. But one of them had to die!

Kennedy's mind was racked by a mighty struggle. What was he to do? Did he owe more allegiance to these tiny parasitic brothers of Man than he owed compassion and mercy to these weird but godly creatures who had rescued him from the Things in the darkness of the cavern?

Which course was he to pursue? Would it not be infinitely more diabolical to snuff out countless millions of tiny human lives than it would be to allow those tiny human lives to wipe out a vast civilization?

Kennedy dug his nails deeply into his palms and tried to keep from screaming aloud.

"Kill the homunculi," he muttered—and his mind called him "Murderer! Murderer!" until he gasped his agony aloud. "Help me! Help me! Tom!"

Miller looked at him for long moments, then rose and tore the culture of the homunculi from the microscope stage and ground it to the floor with a savage heel.

Kennedy took a deep breath. He stood up, and a smile crept slowly over his drawn features.

"You're right, Tom," he said. "Dead right!"

Kennedy called out to the unseen creature who patiently awaited the answer that meant so much. A moment later the anxious query sounded in his mind.

"Have you decided?"

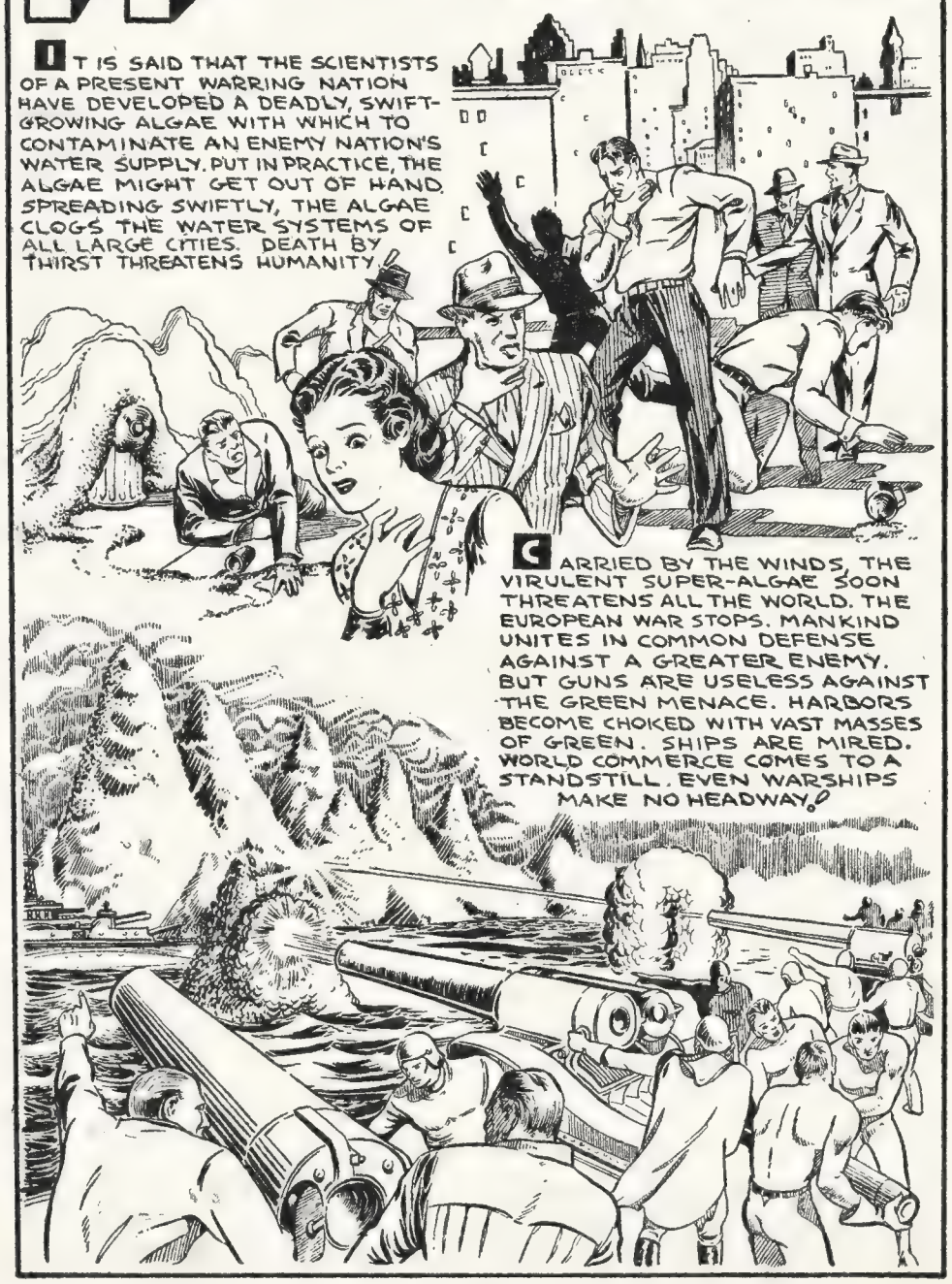
"Yes," said Kennedy wearily, and let the knowledge he had carefully suppressed seep into the foreground of his mind for the creature to read.

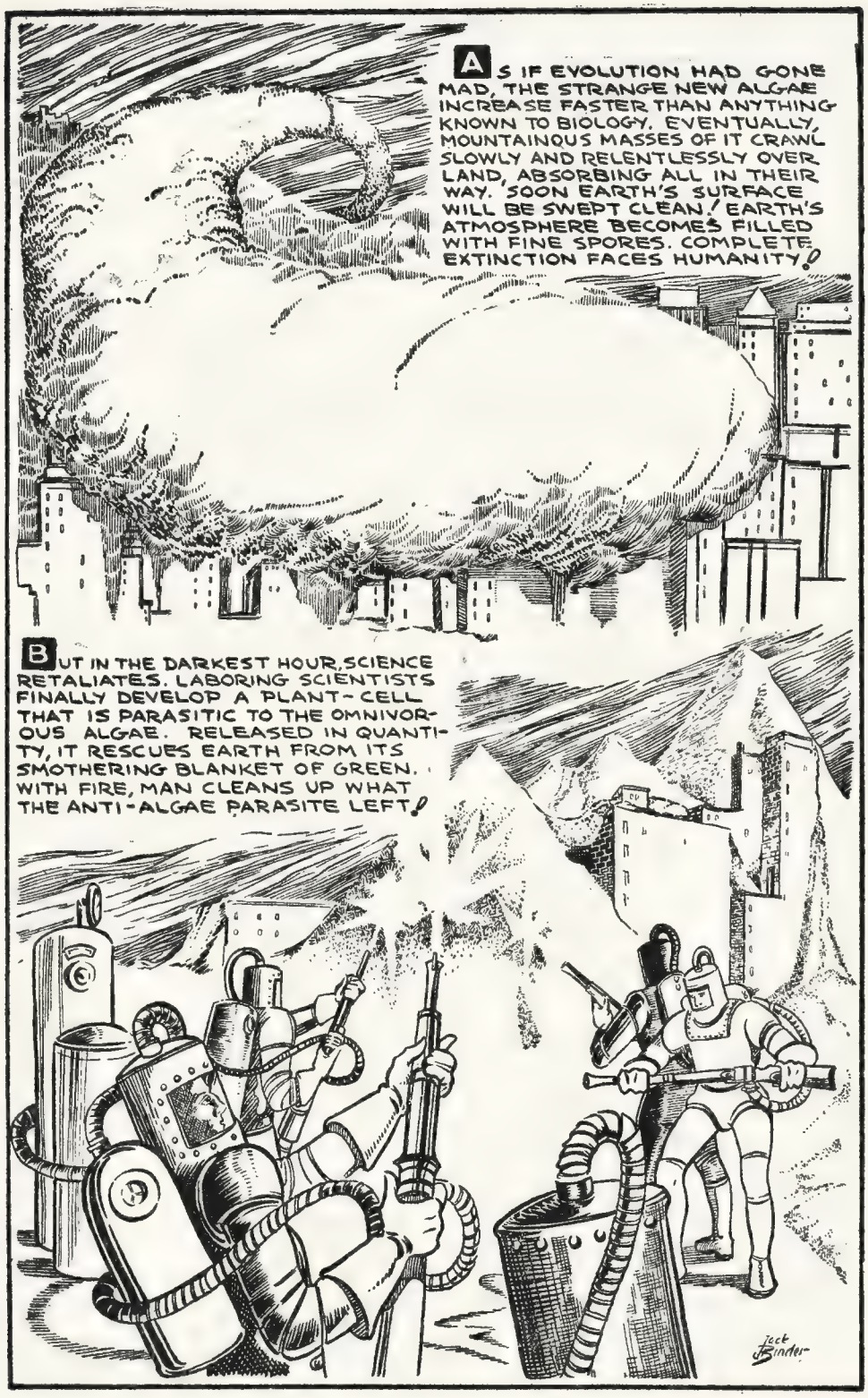
"Botulism is the answer to your problem," he said deliberately. "The *bacillus botulinus* manufactures a poisonous secretion which produces the deadly phenomenon of botulism in human beings. One teaspoonful of the pure secretion would kill every human being on Earth's surface. And you have *botulinus bacilli* in your museums large enough to produce a gallon! A minute injection of the secretion into the cysts of the homunculi will destroy them instantly. So small an amount of the poison is necessary that it should not affect the simpler cellular organization of your race."

The blessing that Kennedy found in the mind of the unseen creature was worth infinitely more than a thousand thanks. And with the blessing came a promise of a safe return to the surface world.

The two scientists bade their mentor farewell. They had given a mighty civilization a formula for life. And now they were returning to their world—and their life.

IF PLANT-LIFE REVOLTED




AS IF EVOLUTION HAD GONE MAD, THE STRANGE NEW ALGAE INCREASE FASTER THAN ANYTHING KNOWN TO BIOLOGY. EVENTUALLY, MOUNTAINOUS MASSES OF IT CRAWL SLOWLY AND RELENTLESSLY OVER LAND, ABSORBING ALL IN THEIR WAY. SOON EARTH'S SURFACE WILL BE SWEPT CLEAN! EARTH'S ATMOSPHERE BECOMES FILLED WITH FINE SPORES. COMPLETE EXTINCTION FACES HUMANITY!
BUT IN THE DARKEST HOUR, SCIENCE RETALIATES. LABORING SCIENTISTS FINALLY DEVELOP A PLANT-CELL THAT IS PARASITIC TO THE OMNIVOROUS ALGAE. RELEASED IN QUANTITY, IT RESCUES EARTH FROM ITS SMOTHERING BLANKET OF GREEN. WITH FIRE, MAN CLEANS UP WHAT THE ANTI-ALGAE PARASITE LEFT!
Jack Binder

THE NIGHT THE WORLD ENDED

By EDMOND HAMILTON

Author of "Captain Future's Triumph," "Doom Over Venus," etc.

The blazing white sphere hurtled closer to Earth

Voss' Cyclotron Can Settle Earth's Fate—But Earth's Doom Settles the Fate of His Cyclotron!

ROSCOE VOSS folded his chubby hands over his plump stomach, and stared with round-eyed, assumed innocence at his two visitors.

"Atomic power?" echoed the plump little promoter. "I don't know what you're talking about, gentlemen."

One of the two men—the tall, haggard, blond young scientist who had given his name as Chad Walters—made an impatient gesture.

"Voss, you're lying," he retorted accusingly. "You have the secret of atomic power in your possession now. Clyde Finchley discovered the secret and perfected a practicable cyclotron-turbine. But he died a week ago. The model of his cyclotron was missing from his laboratory after his death. You always wanted that secret, so you stole the model, Voss!"

Roscoe Voss looked indignant. "See here, you two. You may be big scientists up at Gotham University, but

you can't come here and insult me with such accusations. I hardly knew Clyde Finchley. I called on him a few times only because he wanted me to finance his project. I don't believe he ever perfected atomic power. It's all a pipe-dream."

Young Chad Walters, and the older, graying man — Doctor Thaddeus Leigh — looked in silence at the fat promoter for a moment. Then Walters spoke bitterly.

"You're not fooling us, Voss. We know you took that cyclotron. And we know you are planning to sell it to the warring nations abroad. For the sake of money, you're willing to let loose atomic power to devastate the world. You can't do that!"

Doctor Leigh, the elderly astronomer, spoke for the first time. He had a heavy, brooding voice.

"No, Voss. You must give us that cyclotron. It's the last chance to save a small number of human beings from the coming catastrophe."

"Coming catastrophe?" Voss repeated. He sneered. "What are you talking about?"

"The Earth and all its people are going to perish within a few days, perhaps within a few hours," Thaddeus Leigh replied. The astronomer spoke softly, as though explaining to a child. "A great mass is rushing toward Earth from outer space—an asteroid that has broken from its orbit and is heading toward Earth. When it strikes this planet, everything on Earth will be destroyed."

"What are you trying to pull?" Voss snorted. "Why, if there was anything like that heading toward us, the newspapers would be screaming about it."

Leigh shook his gray head sadly.

"No, Voss. Astronomers discovered the asteroid's approach. They agreed to keep it silent until the end. There is no purpose in torturing Earth's people with useless panic in the last hours. Not until the asteroid enters our atmosphere, and starts to glow, will it become visible. It will spiral quickly around Earth and then —strike!"

Incredulity showed plainly in every line of Roscoe Voss' chubby pink face. But young Chad Walters earnestly continued the appeal.

"That's why you must give us Finchley's cyclotron, Voss! I'm a physicist, you know. When Doctor Leigh told me of the coming disaster, I constructed a rocket that would enable a handful of humans to escape. We might have a chance to keep our race alive on another world. But that rocket can't leave Earth without power — atomic power. Finchley's cyclotron was to have propelled it. Nothing but the cyclotron can make it work. . . ."

VOSS chuckled. His chuckle deepened into a laugh, and his whole fat body shook with mirth.

"I've got to hand it to you two—you certainly are ingenious," he declared. "It takes brains to think up a cockeyed story to scare me into giving up what you're not sure I even own."

"You fool, we're telling you the truth!" cried Chad Walters. His haggard face went livid with emotion. He snatched out a pistol and leveled it at the promoter's chest. "Where's that stolen cyclotron, Voss? Where have you hidden it? Talk fast or I'll shoot."

Voss eyed him calmly.

"I'll tell you nothing. And you won't shoot. If you do, you know you'll never learn anything from me."

Chad Walters stood quivering, his finger trembling on the trigger, his blue eyes blazing.

"Don't shoot, Chad!" Doctor Leigh said quickly. "If you kill him, we won't have even a hope of finding the cyclotron."

Walters slumped, lowering his gun defeatedly. Roscoe Voss snorted in disgust.

"Your wild little bluff didn't work, eh? Now, gentlemen, I suggest that you get out of here. I'm a busy man."

That night, Roscoe Voss strolled through Central Park on his after-dinner constitutional. He hated walking, but his physician had warned him that he must reduce. He made the hated stroll religiously.

As he walked along the dark gravel path, the fat little promoter looked up

at the starry sky. It was blazing with all the radiance of all the summer constellations. He chuckled again as he thought of the bluff that Leigh and Walters had attempted.

"Wanted that cyclotron bad," he muttered in satisfaction. "But they'll never get it. And they'll never find it where I've hidden it. The warring nations will bid billions for a weapon like that. Billions—for me!"

Suddenly Voss heard a quick step behind him. He started to whirl around. Something crashed down on his head. He fell unconscious.

When consciousness returned, he was lying flat on his back. By the gravel he felt under him, he knew he was still on the path in the park. Above him stretched the magnificent sky of brilliant stars.

He tried to get up, found he could not move. He has been bound hand and foot, and fastened securely. He couldn't move a muscle or even turn his head as he lay flat on his back. Two men were bending over him.

"What is this — a holdup?" he snarled. *"You?"* he shouted.

It was Chad Walters and Doctor Leigh. On the two men's starlit faces was a strange, fatalistic look. That look somehow chilled Roscoe Voss.

"You're going to die, Voss," said Chad Walters. "Everyone is going to die. The few who might have escaped in my rocket will perish, too, because you wouldn't give up the cyclotron."

Walters' voice rose shrill with torture.

"You d a m n e d money-grabber! You've doomed our one chance for racial survival. And when the end comes, you're going to realize that. I followed you and knocked you out so I could enjoy seeing you squirm and squeal before the end comes!"

DOCTOR LEIGH'S v o i c e was heavy, reproachful.

"Chad, my boy, this will do no good. Let the man go. He will soon be dead, anyhow, like all of us."

"No!" raged Walters. "When the end comes, I want to hear him screeching for mercy. I want him to realize what he's done!"

Roscoe Voss, pinioned down, listened in amazement. The two men stood over him, darkly outlined against the star-blazing sky.

"What are you talking about?" the promoter cried. "Are you trying to tell me that story of yours about an asteroid is true?"

"Yes," replied Doctor Leigh wearily. "My latest check, two hours ago, showed that the asteroid is quickly nearing Earth's atmosphere. At any moment—"

"Look!" shouted young Walters. His voice was a trembling, terrible cry as he pointed a shaking finger at the sky.

The two men stared, stricken, petrified. And Roscoe Voss, bound and lying on the path, could see better than the other men.

The cold of horror pulsed through the promoter's veins, a throb of icy, hideous fear.

Up amid the stars, a bright red point had appeared. It was a crimson spark, slanting across the stars in a gliding course. Growing swiftly in size, it was quickly burgeoning into a brilliant, blazing moon.

"My God!" Voss gasped. "Is that the—"

"The asteroid!" Doctor Leigh said resignedly. "It's already slanting down through Earth's atmosphere, blazing from the heat of friction. It will spiral around Earth and then strike. When that happens . . ."

"Man will be ended!" sobbed Chad Walters. "If only I could have saved a few!"

Roscoe Voss was shaken by a terrible fear. He saw the blazing Fire Moon cutting across the heavens toward the horizon. It was an appalling spectacle. Long trails of fire streamed behind it, paling the stars.

A fierce wind began to rise and scream around him. He heard the distant yells of terrified men and women, above the rising gale. The stars h a d changed to a p a l l i d, greenish hue in the zenith.

"The air-tides caused by the asteroid's passing," yelled Thaddeus Leigh. "They'll be worse when it rushes back. It'll be near the ground."

"Can't we escape?" screamed the terrified voice. "Your rocket— Is

there still time to install the cyclotron?"

"No, there isn't!" Chad Walters shouted. "You wouldn't believe us when we told you what was going to happen. You wrecked the only chance that a remnant of humanity might survive."

"Wait, Chad— There might still be time!" Doctor Leigh cried, with haggard hope on his redly illuminated face. "Your rocket's right over in Jersey. It'll be at least an hour before the asteroid strikes. Maybe you could get the cyclotron and install it in that time. We might be able to get away with a few people from Earth—"

"I'll tell you where the cyclotron is hidden if you'll take me in the rocket!" blurted Roscoe Voss. "It's where I put it when I stole it from Finchley's laboratory after he died. I've got it in an apartment I secretly rented. I'll tell you where—"

He stammered the address. Chad Walters stiffened.

"Come on, Doctor," cried the young scientist.

"But what about Voss?" objected the older scientist.

"Leave him here," Walters yelled. "We've got to get that cyclotron at once."

THE two men darted away. Voss, unable to turn or move, yelled after them. His words were swept away in the screaming wind.

"Wait!" he shrilled wildly. "You've got to take me with you in that rocket! You can't leave me here to die!"

There was no answer, except the raging of the gale and the dim tumult of distant, terrified shouts.

Voss' throat was dry with terror. He was doomed—doomed like the rest of Earth. He had thrown away his chance to live. He must die when the asteroid collided. . . .

He shouted hoarsely again. But no one answered, no one came near. He sobbed, for he realized that in the panic, nobody would be in the park.

Then his shouts smothered in his throat. He stiffened in his bonds, glaring wildly at the flaming sky. The asteroid was streaking up in the west. Its quick, spiral rush around Earth had been completed.

Now it was a gigantic blazing white sphere that covered a third of the sky. Rapidly it was growing larger with each swift, ominous moment.

Voss knew it was flashing toward Earth's surface at horribly increased speed. The tremendous collision would soon occur.

"I'm going to die!" he howled over the wind and tumult. "I'm going to die!"

The blazing, pitted face of the asteroid loomed colossal now, filling the heavens overhead. As Voss lay helpless, looking up at it with dilated eyes, he saw that the glowing celestial monster was slowly rotating.

He uttered a prolonged, screeching cry of terror. The whole sky above him roared into flame. He heard a rising, screaming roar. And then he slipped into merciful unconsciousness. . . .

ROSCOE VOSS felt someone chafing his wrists. He opened his eyes dazedly. He lay in a strange, lighted room of enormous size. A big round hall, it had a domed white ceiling which arched high above.

There were circular rows of seats all around him. Near him towered a vast, queer mechanism shaped like a giant dumb-bell.

Blue-uniformed policemen were gathered around him, cutting his bonds. Voss staggered to his feet. He found he had been lying on the mass of gravel that was spread on the floor of the room.

"I'm alive!" Voss choked out, tears streaming down his fat face. "The end of the world— It didn't come, after all!"

"Say, are you drunk or crazy, mister?" demanded a husky cop.

Another patrolman was reporting to a puzzled captain.

"I can't understand it, sir!" the policeman was saying. "The watchman here had been overpowered and tied up. That gravel was all spread around on the floor, and this man was tied and thrown down on the gravel. A big wind-machine was going full blast at him. And the Planetarium's 'Night

the World Ended' show had just been run off."

A horrible suspicion came to Roscoe Voss.

"Planetarium?" he cried. "You mean this is—"

"Sure, this is the Planetarium," said the captain crisply. "Now maybe you'll tell us just what this business all means."

Dismaying realization washed over Roscoe Voss. He had been tricked, neatly duped by Chad Walters and Doctor Leigh!

The two scientists, he knew, had wanted to get hold of Finchley's cyclotron, to keep the secret of atomic power from being used for war. And they had laid this plan to scare him into giving them the secret!

THEY had prepared it by warning him of an asteroid approaching Earth. Then they had stunned him while he took his nightly walk in Central Park. They dragged him while still unconscious into the Planetarium and fastened him down. He couldn't see anything but the artificial sky overhead. They had run off the Planetarium's famous spectacle, "The Night the World Ended," with all its realistic sound effects.

And they had terrified him so into telling them where the cyclotron was. By now, Voss knew, the two scientists had the mechanism—and it was the only model!

"I'm waiting to hear what this was all about, mister," declared the police captain again.

Voss groaned inwardly. He couldn't complain to the police about the cyclotron being stolen from him. He himself had originally stolen it from Finchley's laboratory. There was nothing he could do. Billions, lost!

"It was all a practical joke, I guess," he told the captain falteringly.

And, bitterly, he told himself that that was the truth. It was a joke, indeed—and the joke was on him. . . .

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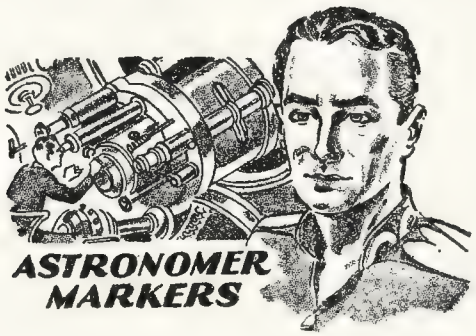
Meet Mercury Expedition No. 1



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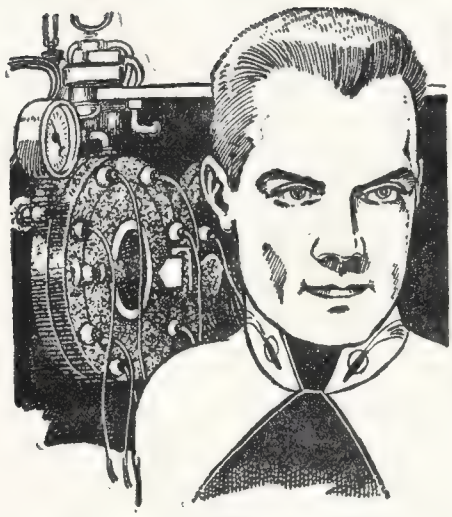

Jan Van Reese

Meet the men who pilot the mighty space armadas of tomorrow and patrol Earth's interplanetary lanes—the heroes, the cowards, and the fighters!

CHAPTER I

The Master Ship

THERE was no great surge of pride in the breast of Jan Van Reese. With several hundred other newcomers to West Point, he was being conducted through the Catacombs of the Spatials.

For the last five hundred years, since the Year of Our Lord 3676, in fact, there had been a Van Reese at West Point. Every last one of them—each a direct forebear of Jan—had attained command of the *Polestar*. Jan had never seen the *Polestar*. What's more, he didn't care whether he ever did. He had heard three generations of Van Reese's talk about it until he knew everything there was to know about the ship. He could have drawn every nut and bolt of it without a single mistake, on a big blueprint.

Jan Van Reese came of a military family, a fighting family—but he was thoroughly sick of the whole business of war. Tradition was all right, yet after five hundred years of other people's bloodshed and Van Reese glory, it was time a Van Reese got tired of the profession.

Just the same, listening to the "ohs" and "ahs" of the other plebes, he couldn't keep down an involuntary surge of emotion that rose and clogged his throat. His father, grandfather, great-grandfather, great-great-grandfather, and their fathers, had each walked this way before him. And each, he must always remember, had commanded the *Polestar*. He did remember. They would never let him forget. And remembering maddened him.

However, what was born in the flesh remained of the flesh. He could not keep from thrilling to the Catacombs of the Spatials, where all the space ships he and the other plebes must learn to drive were housed and tended.

"It's like a blasted cathedral," he muttered disgustedly. "You'd think we were expected to worship the things."

The instructor-guide did not hear Van Reese. But right behind him Sam Parker, a huge two hundred pounder with shoulders as wide as the door of a barn, did hear. He caught Jan Van Reese by the arm, whipped him around.

"Look here, little man," he snarled. "I don't like even a runt like you to make cracks about the Spatials or the Point, see? My dad went to school here and he wouldn't take anybody's insults of these ships. He *did* worship the Spatials. One of them finally killed him, ten years after he was graduated. But that wouldn't have changed his opinion, and it doesn't change mine. Now do you see what these Spatials mean?"

"No, I don't see, you big lug, and get your dirty paws off me. I reserve the right to say what I please when I please, and I say I don't intend to bow down and worship these piles of metal, no matter how miraculous you think they are. They were made by men, and they can be destroyed by men. Now do you get my point of view?"

"But you can't throw out an ancient tradition," Parker protested.

THE giant plebe glowered, as if his argument had settled everything.

"Every generation should make its own," retorted Jan Van Reese, hating the argument because he had to tilt his head back to look up into Sam Parker's face. "Why should I go all soft and sloppy inside just because my ancestors happened to tread these sacred cobblestones? You've got the wrong guy for that."

"Don't the great heroes of the past who graduated from here mean anything to you? Marston, Sclave, Bordis, Crespin—and especially the long line of Van Reeses?"

"No. They did their work. They've been oversold to the world. They were just men. And the least of the lot, to my mind, were the Van Reeses! The only thing they had was tradition."

"My dad swore by the last Van Reese," said Parker grimly. "If you were man-size I'd bust you one, even if they threw me right out of the Point."

"Sometime I'll give you a chance," said Jan Van Reese.

Excitement was stirring in him despite himself. He was only half listening to Parker, whose name he did not know. Regardless of his rebellion against tradition, he could not help being impressed by the glorious lines of the Spatials. No man could help feeling a certain reverence for the ancient Catacombs which housed them.

The conductor, leading the way for the straggling lines of newcomers, was droning off lectures about the different Spatials they reached. Van Reese did not have to listen. Though he had never seen them before within their berths, he knew more about each ship than the conductor did.

There were space ships of all sizes and shapes, built for all purposes. There were the swift light pursuit ships, looking as if they could scarcely stand the destructive lack of pressure of interstellar space.

Without looking inside Jan could picture the instrument panels. It seemed that he had always known the use of every highly complicated instrument.

He knew the buttons which set the deadly rays of dissolution into operation. Those rays, flashing across space, passed through everything they encountered as certainly as did ether itself.

He knew the buttons for the rays of repulsion and attraction, and the invisibility rays. The almost unbelievable magnetic rays were no mystery to him. With them the pursuit ships, if too closely harassed by some interstellar enemy, could draw about themselves a cordon of meteorites, asteroids, or anything solid that might be floating in space. Within the space of a heartbeat, they could create fortresses that, with the use of the other rays, could be rendered almost impregnable.

Jan Van Reese knew each device so well, it was almost as though he had actually experienced all that his forebears had gone through. It was high time, he told himself, that a Van Reese broke with tradition. The old boys had made their own lives. Jan Van Reese had his own life to make, and he didn't want the aid of ghosts.

HE passed the scores of light pursuit ships, capable of racing the lightning. Each pursuit ship was a little world, self-sustaining, capable of cruising in space for the entire lifetime of its pilot and crew.

As he noted the numbers of the various ships, each number instantly recalled to him the history of that ship. *Calypso,* for instance, No. 31, accomplished an interplanetary rescue which had excited the admiration of the Universe, seven years ago. The *Martian,* No. 47, had penetrated farther into interstellar space than any other Earth Spatial. And these were only two of a vast aggregation of light pursuit ships.

Over each ship hung a tube which was slightly larger in circumference than the ship itself. Van Reese did not have to be told what those tubes were. They were the "guns" by which the ships were launched.

The Three Plebes

They dropped down over the enormous bulletlike ships and pressed tightly against the floor for a split second. When they rose again, the ship was gone—miles and miles beyond the thinnest atmosphere of Earth. Those tubes were the invention of an early Van Reese.

Jan Van Reese had a furtive understanding of his rebellion against tradition. The early Van Reeses had done so much, he shuddered whenever he thought of what he had to live up to. . . .

The incredibly vast Catacombs had been modeled along the lines of the ancient Maginot. But of course they descended hundreds of feet deeper into the Earth and covered a considerably wider area. They represented man's greatest engineering feat, with the possible exception of the Catacombs of the Navy, at Annapolis. That question, like all questions arising between the Army and the Navy, somehow never got settled to anybody's satisfaction, because of an ancient rivalry that nobody today really understood.

Why should one segment of defense be called the Navy, and the other the Army? There was really no difference between them, except that they were located at different places, and each exercised a slightly different zone of influence. Actually there hadn't been a Navy nor an Army, within the meaning of the ancient terms, for two thousand years.

"And I'll bet there were Van Reese's in both those outfits!" Jan Van Reese muttered disgustedly. "I'm glad there are no records since the first Spatial War. I'd have another thousand years of tradition to live up to."

The Catacombs *were* the present equivalent of a cathedral. That place of silence would inspire in almost any man a sense of reverence. Dozens of generations ago, Jan's ancestors had worshipped in places much like this, sending up their prayers to the Great One who had created everything. But that old reverence for the First Cause had

almost entirely disappeared in modern man. In its place he had substituted ancestor worship—reverence for the things that had been manufactured by past generations.

Jan could not deny the awe that lifted his heart. He, too, must admire the ingenuity of his ancestors. But he did rebel against the silly deification of men exactly like himself. What they had done, he could do or undo. These ships and tubes were exactly what they seemed, not ideals to which he must bow down. And against such perversion, he would always fight. . . .

SPACE ships of all kinds. Transport ships. Heavy-load ships, which carried colonists to new and important discoveries. All these ships which were Spatial fortresses of unbelievable strength.

Each type of Spatial had its own segment of the Catacombs, and the plebes were led throngh each segment in turn. Van Reese knew—and resented the fact—that the *Polestar* was being saved for the last. It was all part of the ritual, intended to clutch at the throat of the newcomer, to endow him

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with all the sentiment which tradition seemed to call for.

He wished he could turn and run, and keep on running, never to come back. But he was perfectly aware that he couldn't do that. He was the last male of his line. That he should fail to follow in the footsteps of his ancestors was unthinkable.

In two hundred years no male of Earth had been less suited to that life, or looked less like a soldier of the Outside. He was five feet nine inches in height, weighed a hundred and fifty, and had a mop of reddish hair that stood up in shock the second after it had been brushed. Freckles covered his entire face. But his knobby-knuckled hands looked far more awkward than they really were.

"Jan Van Reese, step forward. Out of formation, please."

It was natural for Van to obey commands, without even giving them a thought. To obey, as well as to command, was part of his very bloodstream. He stepped forward, stood stiffly at attention, looking at the officer-conductor.

"Here, sir," he stated with military precision.

"Jan Van Reese, you stand in the presence of the *Polestar*. That should mean much to you, because generations of your family commanded it before they left West Point. I know that your ambition will be to equal their success. I ask you to stand alone for just a moment, as an example to the others here, to show them exactly what we mean by tradition.

"Gentlemen, this is Jan Van Reese. I need not tell you what the name of Van Reese means at West Point. It is known to every child over the age of two in the United Nations of the West. Thank you, Van Reese. West Point is honored to have your generation as a candidate for Spatial honors. Step back into formation, please."

CHAPTER II

Way for the Polestar

JAN felt the back of his freckled neck reddeu. There was a brief spatter of applause which seemed to die of its own weight. He could feel antagonism swamp through the Catacombs, wash at him like flood-waters pounding a rock in midstream.

He had been exposed to view before the plebes as though he had been stripped naked. He had been placed on a pedestal when he would have preferred to hide. He had been thrust into the limelight when he would have preferred the darkness of utter obscurity, where tradition could not find him.

"So, one of the great Van Reese's, eh? Well, I'm Sam Parker, and I'm *not* glad to meet you, Van Reese! .Why couldn't you tell me you were a Van Reese, before I got sentimental about that family of yours? You'll never be able to measure up to them, anyhow."

"Pretty soft, Van Reese," said another voice. "You can ride through the Point on the reputations of your ancestors. The rest of us have to start building our own backgrounds. We'll have to take examinations, and pass them. You'll simply whisper the password—Van Reese—into the ears of the instructors, and you're set. I don't think I like you, Van Reese. I wouldn't even say that much to you if Parker and I weren't going to be your bunkmates. My name is Peter Cory. And here's the fourth of our quartet, Jaret Cable. Look us over, and see what three men look like."

Jan Van Reese felt cold fury rising in him. He hadn't asked to be singled out. But he looked at the three men standing around him. Any one of them would have made two of Jan. Each one looked completely the soldier. They were big, healthy, brawny men.

"I have no intention of asking favors of you cretins," he retorted. "Nor of riding home on the family name. I don't even want to be here, but I can't help it. What I can help, though, is having to talk to lumps of

bone and muscle."

He turned his back on them as the voice of the conductor droned on.

"The next step in your endoctrination will be a brief flight into space aboard the *Polestar*. According to tradition, each new Van Reese takes the bridge for the first flight. But he does not command the ship until he has earned his command. Naturally Jan Van Reese will not fail to make the grade that each Van Reese has easily reached. Candidates, embark!"

Jan looked up at the mighty *Polestar*. For just an instant all his ancestors must have looked through his eyes with him. He felt tears of pride sting and mist his vision. His heart sprang to life with great thumps that shook his chest. More than anything in life, he wanted to win the command of that Spatial. But he wouldn't let them hand it to him. He was going to earn it. . . .

Behind him he heard snorts of derision. He had to fight with all his power against whirling and attacking them for their unfairness. But he conquered the foolish urge. He already had enough to fight.

WITH several officials of the Point, and the conductor, Jan stood on the bridge of the mighty *Polestar*. In the televisor panel he could see every part of the famous old ship. But old though it was, it had never been equaled by the Spatial builders of the nation. The men who constructed the great ship had made one mighty effort and then stopped.

The *Polestar* was the envy of every nation, of every known world in space. It had everything. Despite its size, it possessed the speed of a light pursuit. It had an ease of maneuverability beyond compare, plus every accommodation for creature comforts. Though it was the greatest interstellar flying fortress, that fact was not immediately apparent.

So deftly had its hull been constructed that only the expert could tell at a keen glance just how thick it was. Nor did anyone not in a position to know realize that the shell was honeycombed with compartments. In each compartment, though, was lodged a Spatial torpedo, which was a pursuit ship, capable of bearing death and destruction wherever it was guided by its pilot and crew of one. A few of those torpedoes had even made great names for themselves, when flown by the sophomore heroes of West Point. According to tradition, West Pointers entered contemporary wars in their second year of study.

The launching into space was an almost unnoticeable event. The greatest tube of all simply lowered over the *Polestar* and clung to the floor tightly. The lines of force exerted by a given planet were concentrated in the funnel thus formed.

By means of a central rotar, this force was fed through the center of the *Polestar*. The great ship would ride out into space like a spider on an invisible web.

An official pressed the button which concentrated the lines of force from the Moon into the tube. Abruptly the *Polestar* shot forth into space.

There was no sensation of great speed, for the effects of acceleration and deceleration were neutralized by some means which Van Reese did not yet know. That secret had not been passed on to him because only a graduate was allowed to possess it.

The *Polestar* seemed to hang motionless in space. Only a whining hum throughout the ship indicated that she was in motion. But one had only to look into the outside televisor to see the Earth speed away, become a great disc, a ball, then swiftly and amazingly grow smaller and smaller.

All around the *Polestar*, but at a respectable distance, flew pursuit ships. Jan Van Reese noted them, and was amazed at their number. He gasped as he remembered something that suddenly assumed tremendous significance. . . .

THE *Polestar* never left her berth without the fullest possible protection against any contingency. The eyes of the planets nearest Earth were forever trained on West Point, watching for the *Polestar* to emerge. Plans were constantly being laid for capturing or destroying her. For that reason, the pursuit ships ringed her around with their invisible lines of force, guarding her with their rays of dissolution and rays of repulsion. They were ready at all times to bring their strongest armament into play.

Loss of the *Polestar* by capture or destruction would be a tremendous blow. She was tradition, a symbol of power and superiority.

Jan Van Reese, at twenty, had the courtesy of the bridge. That it was by reason only of the great name he bore, he knew very well—and resented it with all his being. It wasn't fair to be placed on a pedestal. He had the handicap of his small size to overcome. That would have been enough.

But it was awesomely thrilling to be on the bridge, shooting out into space, and pretending that he was in command.

He peered into the televisor panel which showed him the interior of the *Polestar*. He located each of the plebes at their posts. In each case, the newcomers were close to members of the regular crew of the Spatial. Among the self-consciously proud candidates he saw Parker the belligerent, Cory the cynic, Cable the naturally critical-of-everything.

As he scrutinized his bunkmates, each seemed to feel the burning of his eyes. They turned and glared at him. He knew what they were grimly and silently thinking. He was riding to glory on the strength of his great name.

He wished it were possible for him really to issue commands. He would order all three to the bridge, and set them tasks which would underline the momentary difference between their position. But that would simply have proved their infuriating taunt. He would have had to fight four long years of constant mockery, and he knew his fiery temper would make him do something that would cause his expulsion. The whole situation was not his fault. Somehow he had to prove how much he hated it—and he knew he couldn't. He loved the sense of power too much.

"Your dad went through it, Van Reese,

and your grandfather," Commander Dartt Lovett, senior officer present, said quietly. "Every son of a famous man must overcome some antagonism. The son of an entire line of famous men has even more to contend with. And in the case of the Van Reeses, it grows more difficult with every generation. Can you take it?"

"I don't see any choice offered me," Jan replied without emotion.

As though he had done it all his life, Jan checked the instrument panel, at the same time keeping in communication with every part of the ship. His lips silently formed the commands he would have given had he actually possessed the authority. He could not restrain his eagerness for the day when he would assume command. If only he could drive from his mind the sneers of the three men with whom he must spend the next four years. . . .

JAN heard a slight whistling sound in one of the channels by which the pursuit ships in escort communicated with the mother ship. Commander Lovett answered the signal. The voice of the captain of a pursuit ship, far out from the *Polestar*, came crisply into the bridge, as distinct as though the officer out in space had been there in person.

"We have detected warning vibrations from the direction of Mars, sir. But no enemy Spatials have been sighted. The phenomenon is mystifying. Martians have always been the most envious of our possession of the *Polestar*.

Commander Lovett hesitated for a moment. Glancing at his taut face, Jan felt his heart sink. The situation looked mysteriously dangerous.

"Hold your course until there is something further to report," Lovett said.

There was a pause for a moment. Jan Van Reese felt his excitement rising to fever pitch, as though all the dead enthusiasms of his ancestors were being concentrated in him. He forgot even the antagonism of his bunkmates, as he waited for the next report from space. It came in a high, tense voice.

"A swarm of meteors is heading this way, sir. They seem to be under control of some sort. The vibrations indicate—"

"I know what they indicate," snapped Lovett. He whirled to Jan Van Reese, addressing him as though the plebe were his equal in authority. "What do you make of it?"

"My guess, sir?" said Jan excitedly. "I believe the Martians are afraid to attack us directly. By some mechanical means they have probably gathered all meteors within their zone of influence, and intend bombarding us with them."

"It's never been done before," muttered Lovett. "But we could do it ourselves, with the means we already have at our disposal. The Martians are not far behind us in physical and mechanical evolution."

Again came the voice from the Point pursuit.

"Meteors, sir! They're coming faster than we can travel! They will smash into us before we can return to our stations!"

Jan Van Reese listened intently, trying to guess what it would mean to be bombarded in space by meteors traveling almost at the speed of light. They would crash through even the hull of the *Polestar*, as though it had been made of tissue paper.

What was Lovett going to do about it?

CHAPTER III

Attack in Space

THE face of the commander was white as death. His eyes slitted narrowly as he looked into the televisor panel. Eagerly they returned his calm scrutiny, the officers and crew, and even the Plebes who were making their maiden voyage on the *Polestar*. Despite their confidence, it was obvious that responsibility rested with frightful weight on his shoulders.

Jan Van Reese felt his heart sink into his boots. There was no place here for a commander who had the slightest doubt of the strategy to pursue.

Lovett's first order revealed the fact that he knew the whole formation was threatened with terror from space. It sent every extra officer off the bridge to reinforce the officers at other positions throughout the *Polestar*. Jan knew it was also meant to cut the personnel on the bridge to a minimum. The bridge was more exposed than any other part of the ship—

Lovett snapped another command into the main tube, communicating with the commanders of the entire convoy.

"Every ship for itself! Control of the meteors appears to be one of general direction only. They cannot be altered in their course individually. Therefore you have a chance. Each of you, on his own, can maneuver to safety. They will concentrate on the *Polestar!*"

Watching through the panels, Jan Van Reese saw the pursuits scatter at terrific speed, to escape the plunging approach of the meteors. This was the one disaster from which they could not protect the *Polestar*. Against enemy Spatials, they could fight to the last man. But rays and bravery could have no effect on a swarm of unfeeling meteors.

A great calmness settled over Jan Van Reese, though inside he seethed with excitement. His father had told him hundreds of stories about battles in space. There was feverish grandeur and unholy glory in smashing back an attack by enemies of intelligence. Against them one had a chance.

But it was horror beyond belief to be attacked by insensate matter. Against it there could be no defense. Its destruction settled nothing, did not even save the ship attacked.

Now Jan Van Reese could actually see the meteors. From this distance, they resembled a vast swarm of bees. He imagined he could almost hear them buzzing. They were so close together that there seemed to be no way of getting through them.

Abruptly they covered almost all of space. And still they spread out as they approached. But even then they did not draw farther apart. Nothing could escape them. They outraced even the swift Pursuit Spatials, though they flashed through space at

a speed near that of light. In seconds the area would be a tumble of metal junk, smashed rock, floating blobs of flesh—

"They might be sacrificing the *Polestar,*" thought Van Reese. "Destroying it would probably seem better than not owning it. If I were in command, I'd form a spearhead of pursuits. It'd be worth it to sacrifice every last one of them to protect the *Polestar.*"

AS the thought came he was tempted to pass it on to Lovett. But the habit of obedience had been too well ingrained in him. He kept silent. The same thought should have occurred to the commander of some pursuit, or to some junior officer aboard the *Polestar.* He could see nothing wrong with the idea. It certainly would be better than abandoning the pride of West Point. But should he offer his idea to Lovett?

"Never suggest anything to a superior," his father had often told him. "Wait for him to ask for a suggestion. Then give it in such a way that he will think it is his own idea. Otherwise, if he pays any attention at all, he'll snap that your job is obedience. So you'll probably get hell besides having your idea stolen."

He was a plebe. Even though he was descended from a long line of *Polestar* commanders, he had no right to suggest military strategy to a man who had been given command of the ship. But everybody was excited. Even Lovett showed the strain of incredible tension. Wouldn't that normal agitation excuse his presumption?

"Commander Lovett," he said, making certain that his voice did not go out over the communication system to the rest of the ship. "There is the possibility that we are making a mistake."

Disapproval tightened the face of Lovett. But he did not let it show in his calm, restrained voice.

"Mistake, Van Reese? In what way?"

"The *Polestar* is being left at the mercy of the meteors, sir. Its loss will outweigh the safety of every pursuit in the escort. Our convoy of pursuits is really a small percentage of those stationed at West Point. If we were to form a spearhead of pursuits—"

"Then," said Lovett quietly, "we would be throwing away the lives of everybody in the pursuits composing the spearhead of defense. In my place, would you deliberately make such a sacrifice of human lives?"

Jan's heart became a stone in his breast. He thought with horror of the result, if his suggestion were to be carried out. He would be responsible for the death of hundreds of men. Could he face that frightful responsibility if he had been the man to give that dread order? He thought more swiftly and deeply than he had ever had to think before.

Balanced against the *Polestar,* none or all of the pursuits mattered in the slightest. The guilt complex of the one issuing the command had no bearing. A government could not be concerned with the squeamishness of a commander.

The great martial names of all past history on Earth were the product of apparent ruthlessness, seeming indifference to the loss of human life. And while this was not yet war, it amounted to the same thing. Death and destruction would follow in the wake of the meteors. Even enemy Spatials would not be so dangerous.

JAN VAN REESE felt intense admiration for the Martians who must have flung these meteors at the *Polestar.* That was exactly what he might have done, had the situations been reversed. He felt overwhelming respect for an enemy who did not expose himself, did not endanger the lives of his own men. One day, he thought, he would consider it an honor to lead Spatial forces against the Martians.

When that day came, when he commanded the *Polestar. . . .*

"Well, Van Reese," repeated Lovett, "if you were in my place, would you order the pursuits to protect the *Polestar* at all costs?"

"Before I answer you, is there a chance to run for it? Can we escape them by returning at terminal velocity to West Point?"

"No. The best armor of the *Polestar* is forward. The meteors will inevitably overtake us. We haven't much of a chance by facing them. But by turning our back, we'll have none at all. The only thing we can do is head right into them and trust to luck to get through."

"Then I must answer your question as I see it. Yes, I would order the pursuits to meet the meteors ahead of us—turning loose on them every available weapon of destruction. The pursuits can get close together, and use their rays of dissolution to their fullest extent. In that way they might blast a path for us through their midst. But no matter how many pursuits we lost, regardless of the number of men it would take, I'd order the pursuits into position!"

Lovett stared at Van Reese as though he were some strange sort of animal. He seemed unable to believe that any human being could so calmly plan something, even in theory, which could result in such tremendous loss of human life.

"It would be mass murder, Van Reese," he said coldly.

"To issue a simple command, sir?" asked Van Reese. His heart was hammering with wild excitement. He had noted that Lovett, gripped in the horror of the moment, was standing right beside the tube which shot out messages to the pursuits. "It would be so simple, sir. What would one have to say, to change the whole situation?"

"Formation against attack by meteor swarm! Pursuits in tight spearhead! *Attack!*"

Van Reese fell back a step, pale despite his triumph. Lovett had not noticed yet, but the message had gone out.

The Pursuits were returning, swinging back under the meteors at their maximum speed. Their rays of dissolution were already in operation.

Lovett did not notice until he saw the mad excitement in the face of Van Reese. Jan was studying the panel which mapped the vast segment of space where the issue

would be decided.

Lovett whirled, started to shout into the tube again.

But he was too late. The vanguard of the meteors swarmed around the whole formation. Space was filled with enormous projectiles such as man had never before used against man.

Lovett's hand went to his heart. His face grew pale as death. He sank to his knees beside the control panel—leaving Van Reese alone on the bridge!

CHAPTER IV

Strange Coventry

JAN looked ahead. For the moment, the pursuits were holding their own. Their rays were reducing hundreds of the meteors to dust. But where one huge tumbling boulder was destroyed, there were scores to take its place.

Suddenly Jan understood. No time could be given for reports to be sent from the pursuits. But he knew they were trying to cover the retreat of the *Polestar*. . . .

Jan Van Reese, commanding by the grace of good or evil fortune, reversed the *Polestar's* course. He shot her back toward her berth at swiftly rising speed—speed which rose to terminal velocity before the end.

Behind him the pursuits fought on. Some of them were struck, to vanish into nothingness. Jan went sick each time he saw this happen. But he felt he had been right.

And then, abruptly, the *Polestar* was dancing, bucking, in a maelstrom stirred up by the meteors. Something happened, some shock which he could not understand or explain.

Jan himself went out like a light. He did not know when subordinates of Lovett reached the bridge, to regain control of the *Polestar*.

He fell into darkness with the feeling that the trick he had played had been justified. What others would think he had no way of knowing. . . .

But when Jan Van Reese slowly regained consciousness, he knew he had begun his career at West Point with abject failure, in the eyes of his fellows. None of them knew what a born commander would have done in the same situation. But that did not alter matters at all.

When he heard voices, something inside him warned him not to open his eyes. He knew by the odor of disinfectant that he was in the West Point hospital.

"It's a disgrace to the Point and to the great name of Van Reese," said one voice. "What the hell's wrong with this latest Van Reese? When Lovett was knocked out, something had to be done, even before the second in command could reach the bridge. But Van Reese cut out and ran for home! He left the pursuits to hold back the meteor swarm. They did it heroically, and the *Polestar* was saved. But just think of the tremendous loss of prestige!"

"Are you quite sure, Doctor Remsen," said a second voice, "that it wasn't an accident? Van Reese was left in command for a moment. Didn't he lose consciousness with his hands on the controls—and reverse the *Polestar* as he fell? After all, something of the sort happened to Lovett."

"Lovett isn't saying anything. He is a man of the highest honor. There are rumors of a trick that was played on him by Van Reese."

Van Reese kept his eyes closed, but he felt his heart go cold. They thought he was still unconscious, and were discussing him as though he were not present.

But were they sure he was unconscious? Or was he meant to hear? He could not believe this possible. His family had convinced him, all his life, that no graduate of the Point could conceivably do anything small or mean. And he was just as certain now as he had been when he had tricked Lovett, that he had done the right thing.

VAN REESE made up his mind. He moaned a little, twisted on the bed, tried to lift his arms. He behaved as he would have in returning to consciousness. Then he opened his eyes, looked wildly about him.

"Where's Commander Lovett? How is he? What happened? Were many of the pursuits destroyed? What has the commander reported? Did the *Polestar* return unharmed?"

"The *Polestar* is safely in her berth," said Remsen coldly. "Thanks to the fact that she ran away. Her equipment, had she remained, would have made it possible for her to have saved dozens of the pursuits. Instead, they were smashed, destroyed by the meteor swarm."

"But the *Polestar* was filled with plebes," Jan Van Reese protested.

"They were not children. They came to West Point to become soldiers. Their lack of training does not matter. They knew, when they came, that their lives might be endangered. They certainly expected danger when they were to become regulars."

"Then," said Jan calmly, "it was a mistake for the *Polestar* to turn back?"

"I am a doctor, not a tactician," retorted Remsen. "I don't know. I only know what the general concensus is at the Point. Whoever turned the *Polestar* back, did a cowardly thing. By the time someone in real authority reached the bridge, it was too late to do anything but continue the terminal velocity dive."

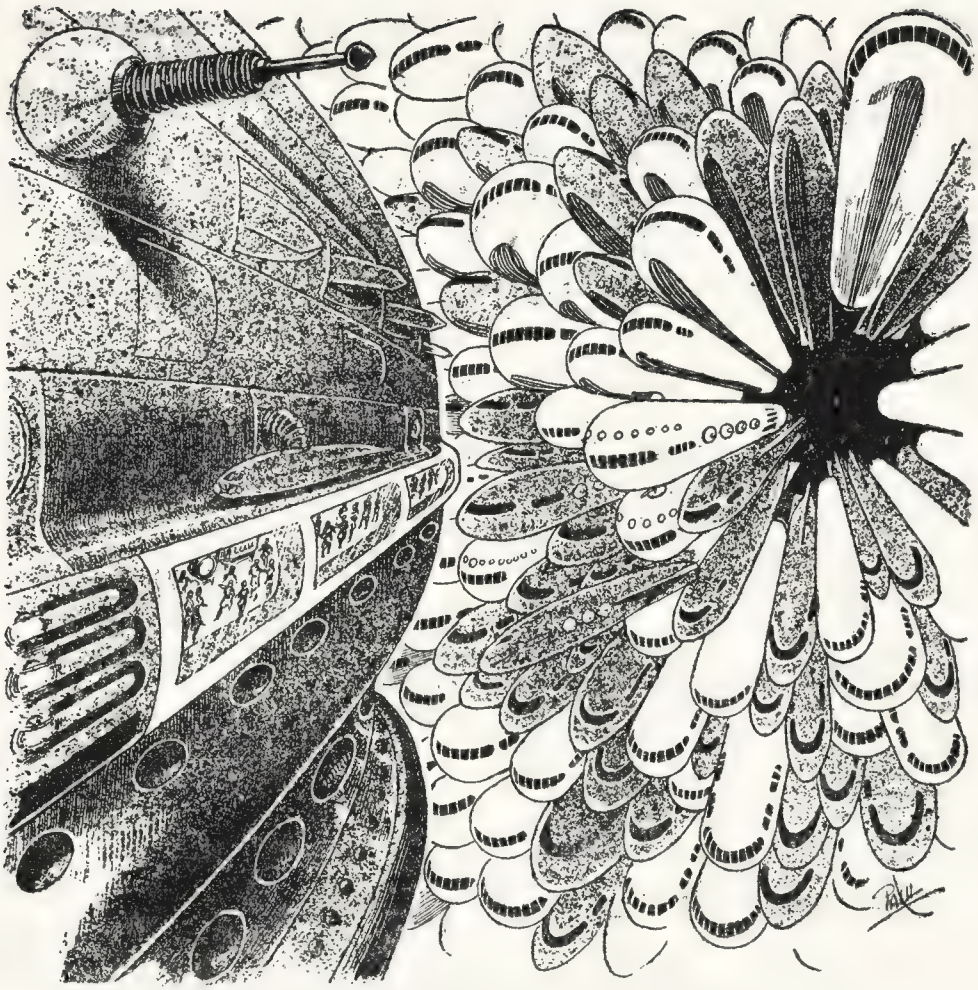
Jan's heart was a cold stone in his breast. He suddenly realized what all this might mean to him.

"Am I all right now?" he asked tonelessly. "May I go to my quarters?"

The two doctors exchanged glances. Remsen nodded curtly. Jan rose from the bed. He couldn't have been unconscious long, for his clothing hadn't been removed.

He stalked from the Infirmary without a word of thanks, without looking back. As he traversed the main hall, he saw his reflection in a huge mirror. For some reason he felt smaller of stature than he had ever seemed. His reddish hair was more unkempt than ever before. His freckles were pale with shock, but still plentiful.

He glared at himself, as at something repulsive. But he noticed one thing. There was a new stubborn set to his chin. Maybe



Space was filled with enormous projectiles such as man had never seen before

he really had something, hidden away under the unwanted red hair, the turkey-egg freckles.

His shoulders squared involuntarily as he strode from the hospital. Outside the door he ran abruptly into half a dozen cadets, who looked smart in their uniforms. One of them started to speak to him, already had his mouth open. But someone nudged him, and all six turned their backs casually, as though by accident. Jan's lips pursed. He had to find out about this.

"Can one of you gentlemen direct me to my quarters? I bunk with Parker, Cory and Cable. I'm Jan Van Reese."

THEY started talking among themselves about some game or other that was to be played in a month or so. If they heard him, they gave no sign whatever. Those severe backs were walls past which he could not go. They had shut him out completely. He knew without a question that he could expect the same treatment from the rest of the Point.

But he did not feel despondent, though he had every right to do so. Here was something to fight, and he was accustomed to fighting against such absurd obstacles as having red hair, and being a runt. He'd had to combat these physical handicaps all his life. Fighting another ridiculous ostracism couldn't even affect his loneliness. He had been so lonely, ever since childhood, that he no longer noticed the fact that nobody wanted to befriend him.

But he wished it had been something he could have fought physically. He couldn't, though. Bigger men shied off from him either because they were afraid of being beaten by a smaller man, or they did not want to be accused of picking on one. Fists and fighting were out, if he were to beat this weird coventry. He couldn't whip all West Point. Even if he could, he could not force it to talk to him.

As always, he had to rely on his brains. He had constantly needed more than his share of intelligence to surmount past obstacles. The fact that he was at the Point at such an early age proved it. Few boys so young had ever entered the Point and those few had been Van Reeses, of course.

It had to be a test of intelligence, though he knew it would not be entirely satisfactory. Youth placed far less premium on

brains than on physical prowess. Well, there was something of that in his action, too. He had faced danger without shrinking. Turning tail on the pursuits, knowing that he had condemned them to inevitable death, had taken courage of the highest sort. He knew he had acted correctly, the way the old Van Reeses would have done.

But he hoped his mother would not hear of his heroism. If she heard of it from anyone but himself, it would indicate the Point's reaction. And he would not tell her, for no Van Reese had ever boasted.

He found his way to his quarters quite easily. He saw the broad back of Sam Parker turn into the path ahead of him, assumed that Parker was going to their quarters. So he followed him grimly.

As he passed group after group of cadets, their backs turned on him. But there was no interruption of conversations. Even when the conversation was about him, they did not lower their voices at all. They all acted exactly as though he did not exist.

"I can't believe that a Van Reese would show the white feather! But you can't argue about it. Everybody knows that he cut and run!"

"They say he tricked Lovett into sending out advance guards of pursuit planes, against the meteor swarm. Nobody can be sure, and Lovett can't say anything. He has to take responsibility for everything that happened while he was in command. Van Reese would know that, of course, with his military background. So Van Reese accomplished whatever he wanted to with his trick. He couldn't be blamed for it—and he won't."

JAN walked on, pretending that he did not hear. But the blood hammered in his brain and his temples throbbed. The cards had been stacked so rapidly against him that they were unbeatable.

He entered his quarters directly behind Parker. Parker tossed a visigram on the table. Van Reese knew it was for him. His trio of bunkmates ignored him. But he would have to open the visigram, and they would hear its contents.

For a moment he felt he had to go away somewhere, where nobody would hear it. Then, with an explosive "damn!" he released the catch of the chrome mechanism. It looked like an ancient cigarette case and was actually a television receiver. The sender-picture and message remained static while the container was closed.

The case opened. Instantly the masklike face of his mother appeared in the middle of the crystal rectangle which was the mechanism of the case. Her white lips parted as she spoke to him. Those words he would never forget.

"Your father demands that you come home. You have disgraced the family name. He intends to have the records changed at West Point so it will never seem that you have even registered there. Just don't answer, don't say anything. Come home without arguing. He knows all about it from the telecasts." Her voice broke and her hands sprang up to cover her eyes. "Maybe we can help you build another career. Oh, my son, my son!"

Never, this side of the grave, would he forget that recorded scene. Her face was always so tired, for most of her life she had lived in the oppressive shadow of tradition. Jan's father treated her practically as though she were a soldier in his command. If there had been any real tenderness in him, Jan could not remember it.

He lowered the case to the table.

"He'd better go back to his mother," stated Sam Parker. "Fact is, if he doesn't, he should be forced to!"

"Yes, and start playing with toys that can't hurt him," said Cory. "He's not big enough for the Point, morally or physically."

"And he ought to lock himself in his nursery," added Cable.

Jan Van Reese heard himself replying, apparently through no volition of his own.

"Sorry, Dad's got it all wrong, Mom. I can't come home. But don't worry about me. Everything will be all right."

She almost smiled, as though she only partially understood. Then her face faded out, and dreadful loneliness descended on Jan Van Reese. That loneliness, he knew, would last for years to come. Certainly no Van Reese of the last two or three centuries had been faced with such obstacles as lay across his path. And even his bunkmates, who were usually exempt from the exercise of cruel coventry, were against him.

But what could he do?

HE could start with his own roommates, command their respect in some way. But how? What was the thing in which youth most believed? He knew exactly what it was, for his lack of it had been solely responsible for his lifelong ostracism.

More than anything else, youth admired physical ability. They respected anyone who could go long hours without sleep, work at a given task until he was ready to drop with exhaustion—and then work endlessly on, past the limit of endurance. Particularly they admired one who could face the gravest danger conceivable without flinching. According to general belief, Jan Van Reese had not done that.

What was Lovett waiting for? Why had he said nothing, explained nothing of what had happened? Should Jan ask him? What should he do? Nothing, of course. Lovett would send for him if he had anything to say to him. It was stalemate there. Apparently, from all Jan had heard, there were no charges against Lovett. In sending out the pursuits to hold back and attempt to destroy the meteors, Lovett had done the right thing. Jan smiled to himself, remembering Lovett's objections. They weren't blaming him for strategy that was justified.

But Jan? Well, Jan had cut and run—

CHAPTER V

A Van Reese's Brains

HE rose from the chair beside the table where he had left the visigram. He glanced down at it. As an afterthought, he pressed the return button. Instantly the

visigram packet vanished from sight. It had been returned by radio control to the station whence it had emanated.

It was a minor miracle, that return. During the split-second of its return, the visigram would be invisible, capable as ether of penetrating anything. But it would return to its proper form on receipt at the office from which it had been sent.

It was almost as though he were wiping his family from his mind, out of his heart.

He faced Sam Parker.

"I didn't show yellow," he said grimly. "They're all wrong about that. I cut out, of course. But it was the right thing to do! I know it was. The value of the *Polestar*—"

Parker looked right through him. Jan's lips tightened into a straight line. If ever he was going to win his way into the good graces of West Pointers, he might as well begin right here. There was a way to prove one's courage. Not in centuries had mankind actually reverted to the use of fists. But now he would.

"You know," he said with ominous calm, "usually a man's own bunkmates don't put him in coventry."

They refused to answer him.

"I'm going to have some consideration from you fellows while I'm in the same quarters with you. I don't care if I have to get my face hammered in by each one of you to get it!"

Sam Parker's lips twisted into a contemptuous sneer. It was then that Jan Van Reese struck out. He hit him with all his power, squarely on the chin. He had to leave the floor to send the blow home.

He had learned to deliver such a blow from the ancient diaries of the Van Reese family. Some of the men had been masters with their fists.

Parker's great head went back. A look of surprise crossed his face. A trickle of blood showed at the corner of his lips. The mouth of Cory and Cable hung open slightly. They stared at Jan Van Reese as though he were committing cannibalism. But they did not interfere, and Jan went to work on Sam Parker.

With all his power, and as fast as he could drive them home, he hammered rights and lefts to Parker's face, torso, stomach. Parker gasped and bent almost double. That brought his face within easy reach of Jan's right. He swung it in a mighty uppercut.

To his own amazement, Parker went over backward, hitting the floor squarely with his head and shoulders.

Plainly, this ancient way of commanding respect had a lot to recommend it. But there was nothing of the coward in Sam Parker. With a roar of anger he rose to his feet, charged at Jan Van Reese.

HIS hands were not closed into fists. Had they been, he could have taken Jan's head off with a single smashing blow—if he could have connected. But he did not even try that. Instead, he sought to grasp Jan about the middle with his tremendous arms.

Jan knew as little about this instinctive, self-protective manner of fighting as Parker knew about fisticuffs. Before he could divine Parker's intention, the huge arms were locked around him. The great cord-like muscles constricted his body like live snakes of the ancient world.

He felt his ribs give under the tremendous pressure. The strength started to ooze out of him again. He recalled the momentous incident in mid-space, when the darkness had first begun settling.

But it did not settle so quickly now. Jan's arms were not pinned. With all his waning strength he began to smash short, choppy rights and lefts to the face of Sam Parker. His knuckles made him writhe with agony when his fists connected.

He did not realize until then that in closing his fists he had turned his thumbs in. They were between his fingers and his palms. He must have broken both thumbs with the first blows he had ripped at Sam Parker, without realizing it in the excitement of combat. He slipped his thumbs from under his fingers. The movement tortured his thumbs with as much agony as the gigantic arms were filling the rest of his body. But now he was correctly "making fists."

He realized it when he continued sending those short, choppy rights and lefts to Parker's bobbing head. He slashed his forearm across Parker's nose. It had been a handsome nose before. Now it was a gory smear. The blood from his antagonist's nose spattered Jan's face. Sam Parker began to gasp through his mouth. His eyes told that he suffered excruciatingly. But Sam came of a tribe that would never admit agony nor cry out.

Faster and faster, though he could hear his ribs crack, Jan Van Reese sent in the blows. Still Sam Parker clung, and even tightened his grip.

Something else had to be done. Jan slid his left forearm under the other's chin. Exerting all his power, he pushed the big man's head back. Jan's feet were off the floor. They had been ever since Sam had caught him up in those great arms. Now Jan used all his power. Beads of sweat exuded from his every pore. The arms began to relax their grip.

Still exerting pressure with his left forearm, Jan hammered away at the bloody head with his right fist. And his left arm held the head still so it could not dodge the blows.

Suddenly he was free. Parker was staggering around the room, hands to his face. Blood was oozing between his already gory fingers. Even as he staggered, and fought to keep back the moans of pain, he was glaring at Jan Van Reese. Fury was in his eyes.

But there was also a certain grudging, dawning respect!

JAN VAN REESE flung his small body at Sam Parker. He hammered away, never giving Parker a chance to recover, to get his legs under him. And Sam Parker, to his own amazement, sat down on the floor of their quarters. He glowered up at Jan. He put his palms flat on the floor, tried to push himself up. He failed.

Jan grinned at him through his own smashed lips. His mouth had accidentally been smashed by the forehead of Sam Parker. Then he whirled.

Without warning, he flung himself at Peter Cory. Cory, however, had been watching the fight with Sam Parker. He did not repeat Parker's mistake of trying to get his huge arms about Jan Van Reese. Instead, with great bludgeoning blows, he charged at the smaller man. He had no idea of giving him any consideration because of his size. He had seen what had happened to Parker.

A vast, inner, silent shout of jubilation welled up in the heart of Jan Van Reese. He had made a big man forget that he was small!

Jan ducked under a tremendous right swing that might well have killed him. Peter Cory, responding to some inner fighting urge of a long-vanished ancestor, brought his fist back. The back of his right hand landed flush on the temple of Jan Van Reese. Jan was picked off his feet as though he had been a feather. He did not lose consciousness. He sailed through the air toward a wall of the room.

Instinctively he did the only thing that would prevent him from getting a broken neck. He flung his hands out ahead of him, like a diver preparing to cleave the water.

His hands struck flat against the wall. His arms seemed to have been driven into his body. But, despite that attempt at braking, his head smashed against the wall with stunning, blinding force. He sprawled limply.

Peter Cory stood over him, merciless, peering down. His face was working with rage.

"Want some more, Van Reese? Come after me again like that and I'll kill you!"

"Sorry," Jan mumbled through bloody lips. "I hate to make a murderer out of you, but I guess I have to."

He scrambled to his knees. Cory, knowing nothing of ancient rules for this kind of fighting, swung a vicious right at his head.

Jan ducked under it. He grabbed at Cory's ankles, yanked his feet from under him. The big man sat down so suddenly, his teeth rattled in his head. They clicked almost as though they had been false plates that were jarred loose.

Jan leaped to his feet. To his surprise, a laugh gurgled through the blood filling Parker's mouth. The huge plebe's eyes were dancing strangely in his battered face. Parker had taken a seat on one of the cots, where he could watch.

VAN REESE stood over Peter Cory for a moment. Then he whirled to see what part Jaret Cable was going to play. Jaret showed no disposition to take part in any fight. Instead, he was grinning like a Cheshire cat.

"I have no doubt," he said, "that I can smash you into the floor. I could probably throw you through a wall, but what's the good of it? Besides, I'd get a broken nose trying it, from all I've seen. This nice nose of mine is attractive to girls. So, if you don't mind, just let us say that I know I can beat you, and let it go at that. I've got more sense than Cory and Parker."

Jan Van Reese grinned.

"Don't tell me that you're breaking my coventry!"

"It was broken, as far as I'm concerned," said Cable, "when you practically fractured your skull against that wall, and didn't stop fighting. My guess is that you're right about what happened today on the *Polestar*. I think the rest of West Point is wrong."

"I agree, Jan," said Sam Parker. It was difficult to be sure what he said because his mouth and nose were such a mess. "Why you had to smear me up like this to prove it, I'll never know. Only a Van Reese would have figured out a cockeyed way like this."

"Of course I'm not beaten," said Peter Cory quietly, "and I'm not quitting. No Cory ever quits—very often. But I'm inclined to fall in with what your bunkmates say, and stand by you against the Point. It looks as though there were going to be a great many broken noses around here, before the question of Jan's courage is settled to everybody's satisfaction. Some of the noses will probably be mine, but I suppose I can even get to like it. It'll be worth it, anyhow."

CHAPTER VI

Broken Prison

A WARM glow suffused the heart of Jan Van Reese. He had won his spurs, at least in his own quarters, with his fists. But Van Reese brains had dictated the method. Brains, rather than brawn, had won for him, as brains always had. But he had also done pretty well in physical prowess.

"Let's sort of reach an agreement," said Jaret Cable. "I say that beginning right now, his pals assume the burden of Jan's coventry. Every time we find somebody talking out of turn, we'll bash his head in."

"And get ourselves kicked out of the Point?" asked Cory, shaking his head.

"Do the masters of the Point have to know about the fights? There is a tradition about that, too. It isn't what we do, but what we get caught doing. We won't get caught. Incidentally, on the way here after the landing of the *Polestar*, I could have smacked a dozen noses. And how many others twitched above tempting mouths that blackguarded Jan Van Reese, I've no way of knowing. The officers in command are all against you, too, Jan. They're in sympathy with the coventry the Point has closed around you."

"I know, and I don't want you chaps taking my troubles on your shoulders. It's enough to know you believe in me. Three pals out of several thousand isn't a large percentage, but it will have to serve as a nucleus. Around that I'll find the courage to fight my own battles. It'll make me feel better if I do, win or lose."

"Nix," said Sam Parker. "I've got some rights here. Wasn't I the first to get my face bashed in? I say, let's stick together, four against the Point. If Jan doesn't agree, at least the three of us can handle the little shrimp. And Jan, if you think we're fooling,

just try something. You may be little, and oh my, but we'll have no mercy."

To Jan's amazement, he felt hot tears surge to his eyes. The others noticed, but pretended not to. For an entire minute, Jan could not say anything because of the lump in his throat.

Jaret Cable rose and started for the door.

"Where away, Jaret?" asked Sam Parker. "Are you in on this agreement?"

"Oh, I think I'll just take a walk around the place and see what's doing. Maybe there's some excitement going on that we don't know about. Anyhow, I have the only undamaged face here."

The door swung open when he approached it, and closed softly behind him. It had opened electrically when he broke a ray of light. When passage of his body through the ray had been completed, it had closed.

THE two others sat down on the edges of their cots and laughed much too loudly. Only Jan Van Reese did not feel like laughing. It had suddenly occurred to him that he had really made friends of these three big husky lads. These boisterously laughing giants were the first friends he had really ever had!

It was a good thing to have friends. It made the heart glow. It made a man feel silly, put him on the verge of tears. But it was a good feeling, a warm, delicious sensation.

Cory and Parker stopped laughing and tried to be serious.

"It won't be easy, Jannie," said Parker. "When you're marked with an L at the Point, you have to do a lot of extra work to rub the smell off. Maybe even the three of us can't do much about it. In the end it's up to you, after all."

"I said as much when we formed this quartet," Jan replied quietly. "I've known it all along. But I've got you three gents believing in me. I can make a good try at sending the Van Reese banner up the mast to flutter again in the breeze of family glory."

At this point Jaret Cable quietly returned. His right hand was over his mouth, but his eyes were dancing. He took his hand away and proudly exhibited a mouth that matched any in the room for blood and puffiness.

"It's going to be uphill going, mates," he mumbled. "I got myself a busted mouth before I'd gone fifteen feet around the corner outside the hall. Did you hear a ripping, tearing sound? That was one of my teeth getting knocked out. I gather from this that the whole Point is against us. Any friend of Jan Van Reese is an enemy of everybody. That sort of cements us together, doesn't it?"

"Did any of the officers see you fighting?" asked Jan anxiously.

"No. I heard a guy use the Van Reese name in vain, just as I passed him. He wanted me to hear it, make me show how I felt about the mess. I grabbed him and yanked him behind a mulberry bush. I was just getting ready to use the Van Reese technique on him. What do you think he did when I drew my fist back?"

They couldn't guess.

"He butted me in the mouth with the t of his head! His ancestors must have be goats. Or maybe he's from some farm a forgotten corner of the Western Natio I should say he was from one of the m backward nations."

Jaret Cable grinned, unashamedly sho ing that one of his front teeth actually v missing.

In that ancient fashion, a four-sid friendship was cemented. The cement v plentifully tinged with good red blood fr the quartet of men. But one of them s had to prove his manhood to the rest the Point.

"I wonder," said Jan grinning, "what statues of the old Van Reeses will th when the statue of a runt is erected amo them. Understand what I mean? Noth less than a statue will satisfy me now! the beginning I would have settled fo commission, far down the list, where Van Reese name would have been lost the shuffle. Now I'm out to bolster temporarily blotched family escutcheon."

IT was possible, during most of each d for Jan to lose himself in his studies the Point. Astronomy, mathematics, ast gation, gunnery, torpedo management cupied all his thoughts. There were doz of subjects in which a plebe had to be ter-perfect before he could become a sop more. Dozens more absorbed him as second year man, still more later.

A man had to be almost a perfect m chine, physically and mathematically, bef he could command a Spatial of any ty When a man took a Spatial out, he to with it complete responsibility for the li of her passengers and crew. Dreadful, believable things could happen to machi and people out in space.

Students must learn reckoning to smallest fraction of an inch. An error the shooting forth of a projectile co cause a deviation of thousands of miles the time it reached its objective. Spa flight was an exact science. The scien was allowed but one mistake—invaria his last. Jan's mistake had not been his l only because of the presence of Comman Lovett's aides aboard the *Polestar.*

Jan had a great advantage over his ma because his father and grandfather l drilled him so thoroughly. He scarc needed to listen to lectures, or to crack book.

When he was asked to recite someth from the current studies, there were snee scarcely suppressed, all around him. knew enough for the other students to co sider him the instructors' pet, and he v invariably quiet and studious. He mig have been the pet of the instructors, exc for the fact that they hated him.

But he tried to close that out of his mi He tutored Parker, Cory and Cable, so th not only himself but his bunkmates wo be better than the rest of the Point.

"It will mean just as much to me, if i to my family and to the Point," he to them. "If one of you chaps rise to co mand of the *Polestar,* it'll be the same

if I'd done it myself."

"Snooty about the *Polestar*, after the first flight, aren't they?" said Parker. "Plebes get one ride in it. Then they're never allowed back in its area until their third year. The officers must be afraid we'll steal some secrets from it."

"No," said Jan, shaking his head. "That's not the reason. They deliberately let us go out in her first, then shut her away from us after we have found out what a glorious experience she is. It's a terrific prod to ambition. We won't be satisfied, any of us, until we go out in her once more. And we'd probably be unhappy until we were attacked by Martians—this time in person."

BETWEEN classes, Jan often went out for a solitary stroll around the grounds of the Point. A real man could never cease to thrill at what was to be seen at all times.

The grounds were separated into areas. Each area was allotted to a different kind of Spatial. In the center of each area, at ground level, was a bulletin board. After the student learned its intricacies, he could see just what was happening throughout that area, and in the sky, stratosphere and interplanetary space above it.

Intricate, awe-inspiring things were those boards. They were divided into three sections. The lower section represented the Catacombs directly under the area. It was a blueprint showing every Spatial, every activity, down below. By pressing a button he could see, in miniature, everything that transpired below.

The center of the bulletin board represented the skies as far from Earth as the Heaviside Layer. By pressing that button, he could see which ships were aloft. Each ship from a given area was connected by remote radio control with the bulletin board.

The upper third of each board, however, was the real marvel. This represented the deep reaches of solar space, and still beyond. It showed the observer the ships on patrol. Those were the great Spatials that were commanded by regular officers of the army, and manned by enlisted crews who came of generations of soldiers. Here was where the observer must know astronomy, in order to understand. The upper portion of each board was a miniature Planetarium On it one could see the Spatials from the Point cavort, almost literally, with the stars.

That was where he would be some day—he could glance at the nearest bulletin board. There he could see the Spatial catapulting outward from Earth. Having located it, he could then watch for it to become visible in space.

What a glorious spectacle it was, to see the heavens filled with the graceful, unbelievably speedy Spatials! Even when they traveled the fastest, they seemed to be hanging in space like smaller planets. Like gorgeous jellyfish they floated in a sea of space, with the Sun glinting on their armored sides.

The heavens were always filled with excitement, restless with eternal movement. A vast area, shaped like a monstrous mushroom, was reserved for the Point. No private Spatials or stratosphere ships were allowed to fly over the Point at any altitude.

This invisible area, however, was carefully plotted on maps available to the public, and patroled by retired officers of the army in old Spatials. Outside it, one could see the many-colored stratosphere ships and Spatials of the world, of the United Nations of the West. They were like high-flying, monstrous butterflies. The vast swarm of them sometimes hid the light of the Sun.

While most Spatials were capable of moving in silence, there still was an eternal whispering in the air. Mankind had certainly advanced, become as gods, during the last two thousand years. He had made the heavens his own, out as far as Pluto. That was as far as exploration went. But the inhabitants of many of the planets would never be conquered.

There was still constant warfare between the worlds. Those wars that were as senseless as wars had always been—based on greed, jealousy, and fear. One world went to war with another because it was afraid that if it did not, it would be attacked by the denizens of that world when it was not ready.

There was a whisper of sound, inaudible to ears that were not trained to detect it.

"There went Calypso Thirty-one," said Jan to himself.

Within two weeks after he enrolled at the Point, he had mastered the sounds of the ships which erupted invisibly from the many Muzzles. Even the oldest old-timers knew the voices of only a few. Jan Van Reese almost knew all of them. But he had known them, all but in fact, when he reported as a candidate for a regular commission.

CHAPTER VII

Another Van Reese Idea

THE paths through the grounds were a labyrinth, because they must keep clear of the Muzzles, the yawning pits from which Spatials were shot out on their errands.

It was a never-ending source of thrills to Jan Van Reese to walk slowly along the winding ways, and hear the soft whisperings of the countless takeoffs. Spatials left the Muzzles so swiftly that no human eye could see them go. But when he heard the near whisper, and felt the swift stirring of air,

WEST POINT was a hive. The Spatials were queen bees, and the cadets and their instructors were drones. The ground always seemed to be trembling with activity.

Jan Van Reese walked through all this activity when he was not on duty, and felt as though he were master of it all. At such times he scarcely noticed that no one spoke to him, that everybody, officers and cadets, ignored him. It was something of a distinction to have the officials to join the act of coventry against a cadet. So few students had been so thoroughly excommunicated, he was practically a celebrity.

Jan did not fight openly against it. He simply bent every effort to making a good soldier of himself, though all the cards were

stacked against him.

Gradually his resentment gave way to a fierce determination. He would not only live up to family tradition and make the Point respect him. He would make something of *Jan* Van Reese, over and beyond what his fore-bears had done for the glory of the family.

After hours, the four Aspirant Spatials—as Parker, Cory, Cable and Van Reese called themselves—left their quarters. They walked about the grounds, within the limits prescribed by regulations. They were quite belligerent about it, too. Marching four abreast, they plainly did not intend to make way for anyone.

Now and again, when there were no officers within sight, other cadets challenged them. Many swift, bloody battles with fist and skull were fought, without a word being said. Not even in the heat of savage give-and-take would the cadets break coventry. They had agreed not to talk to Jan Van Reese, and nothing could induce them to break the tacit agreement.

Eventually it became trying on the nerves of everyone. But by that time Jan had decided on a campaign of his own. He took his mates into his confidence.

"The *Polestar* is our answer," he said. "The poor old gal doesn't dare poke her nose up through the Heaviside Layer without the Spatials of other planets taking a crack at her. As long as we have her, she is a liability. The other worlds are jealous because they know that while she exists, we can threaten to send her out—properly escorted of course.

"If we can get her close enough for her torpedoes to be loosed, she can capture a planet almost single-handed. She'll always be the cause of bitterness. Well, I have an idea that might change her from a terrific liability to a huge asset. All I have to do is get the big shots to listen to me.

Sam Parker grinned.

"I can just imagine them listening to you," he said. "Or to any of us, either. They'd worry that the suggestion came from you. But maybe we can get around that. Let's have it."

JAN hesitated. He knew the idea would shock them.

"War is a contest. It's a game, played with the lives of men at stake. Therefore it's absurd. Yet for millions of years men have found no other way to settle their differences. What would happen if we were to find such a way?"

"And fill the Universe with peace?" snorted Cory. "What would become of places like West Point? We thrive on war. If there is no more war, we're out of jobs. We'll have to find work!"

"Well, it won't happen in our time, but we can make a start. In place of war, I suggest a new game."

"A game? What are you driving at?"

"Well, call it interplanetary football if you like. Any of you chaps ever hear of football? Of course not. You're uniformly rotten in ancient history. Well, it was a game that was played regularly between rival school teams, thousands of years ago. The opposing teams almost killed each other to push a bladder over a white line, or to kick it between a couple of poles with a cross-bar near the top. It must have been dull, but old records indicate that people who watched got terribly excited and yelled themselves hoarse. I propose a variation of that."

"But where does the *Polestar* fit in?"

"She's the prize, or rather her sister ship is. We will award a set of plans for the construction of a sister ship to the winner. If any team from any planet can win three times in a row, ownership of the plans—and a potential *Polestar*—passes to that planet. Theoretically it becomes equally powerful with us in the Solar System. Of course, I don't think anybody will ever win

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from us three times in a row.

"Afterward, if some planet does win, it can lose the new ship if another planet wins three times in a row. By that time, in all probability, we will have built a Spatial which will be a vast improvement on the *Polestar*, and it won't matter. Yes, I know that's sacrilege!"

"I don't follow," said Parker, plainly mystified.

"All right," said Jan. "I'll explain football as well as I can."

A football fan of 1940 would have writhed with outrage on hearing the explanation, but Jan stated the general idea of the game well enough for his purpose.

When he had finished, Cable immediately spoke ironically.

"So we play football in space, with the *Polestar* apparently serving as the coveted prize. That's a great idea, all right. We simply fly the crowd out to a given spot in space. Then eleven players from the opposing planets step out into space and kick a ball back and forth."

THAT would have stopped a weaker man, but Jan explained patiently.

"No, this ball will be too big to kick. It won't be a ball in the accepted meaning of the term. It will be an asteroid. The team members will be pursuit Spatials, eleven on a side. You see, we never seem to get away from tradition. Let's say that Earth—which in this instance means West Point—opposes the Martians. Then Earth becomes one goal, Mars the other. The referee shunts an asteroid into space, midway between Earth and Mars. The Spatials may have crews of any size they like, so long as there are only eleven Spatials on either side in the game at a given moment.

"They start the game. If Earthmen can force the asteroid into contact with Mars, that constitutes a goal. If Martians can force the asteroid into contact with Earth, that's a goal. The winner, at a given moment after a set number of periods, has one leg on the cup, which is the ship's plans."

"It's utterly crazy," said Cory. "How are we to trust people from the other planets to play square?"

"That's just it," replied Jan. "We can't trust them. But we can interest the Universe in the sport. Crowds, fleets, armadas of Spatials, will gather to watch. If they try anything, we have all our enemies together. If they don't, we'll give them lessons in sportsmanship which would be good for every planet concerned. If we all had it, there would be no need for war."

"All right," said Cable. "Where do we go from here? How do we get this idea started?"

"Simply drop detailed suggestions in the general suggestion box. We'll have to have them signed by someone who doesn't belong to this bunkhouse, or the big shots will suspect that the suggestions come from me. Now, taking into consideration the fact that nobody is speaking to us, how do we get someone else to drop the suggestion and start things moving?"

"I haven't been fighting everybody the last few weeks just to learn nothing," Cory said. "I'll get somebody."

"And I'll get somebody else," Cable added.

"I'll forge somebody's name as a last resort," said Parker. "The suggestion is damned good. Even if the guy whose name is on it never heard of it, he will agree that it's his own idea. But I don't suppose he'd care to be questioned much about it."

"Good. Then let's get started."

Next morning, on the desk of the commandant, among other suggestions, was the briefly stated plan that Earth challenge Mars to a game of "Asteroid." Rules of the game were set down, and the suggestion that the *Polestar's* construction plans be the prize for the three-time winner. The winner should be best three out of five games.

"A lot can happen in a five game series," said Jan, grinning, when the first whisper of it got out. "Between such doughty opponents as Earthmen and Martians, it may even be more exciting than an undeclared war!"

CHAPTER VIII

Give and Take of Battle

WITH the speed of wildfire the idea caught every imagination. There was nothing more boring than peacetime maneuvers. A game which had all the aspects of war, without its deadly dangers, appealed to West Pointers. It appealed almost as much to the peoples of Earth.

Within two weeks after the suggestion had been handed in, a memorandum of it was posted on all bulletin boards save those assigned to the various Spatial areas. West Point got pretty excited about it.

It was cold comfort for Jan Van Reese to know this. Nobody but his bunkmates knew whence the idea had really emanated, and he had sworn them to secrecy. Often they heard nasty remarks to the effect that it didn't seem possible that such a brilliant proposal could have come from anybody but a Van Reese.

Plainly, the consensus seemed to be, the Van Reese name was not being covered with glory in this generation.

By permission of the General President of Nations of the West, the commandant issued challenges to the military of other planets. The result made Earth recoil with amazement. The whole proposition was regarded with the utmost suspicion. What sort of trick was Earth planning now? Had it become too decadent to depend on war to settle its differences?

The whole idea was exciting enough. But it should have been a game between rival Earth schools, for instance, not a challenge flung at the outer worlds. It hadn't even been done in the usual diplomatic fashion, in veiled language. The challenge simply broached the suggestion bluntly.

> We challenge you to a game of Asteroid, rules herewith transmitted by radio, with our Polestar's construction plans as the prize for three consecutive wins.

Pluto, far out, was the first to answer. She would prefer to see how the game was played a few times, before committing herself. The suggestion of the formation of a

Conference, which she might or might not join, came from the most distant planet.

Uranus said that she found the idea interesting, but she would prefer to await some expression from Saturn, Mars and Jupiter. Saturn remained silent.

Jupiter accepted the challenge provisionally. She said that if, by common consent, peace could be maintained for a period of one year, she could take that as proof that games could be played in more or less friendly fashion. In that highly desirable, but unexpected event she would send a plenipotentiary to discuss the matter.

The answer of Mars was blunt, and to the point. It caused the faces of the West Pointers to go gray and then red with fury.

It is interesting to note that Earth is becoming increasingly fearful of her chances in any armed conflict with Mars, greatest of the planets. That she now proposes harmless games to settle differences is proof enough of that. For our own part, we have no fear that we would be unable to defeat her at anything, but the whole idea seems fearful. Why not, instead, settle everything, once and for all, in a pitched battle in space?

It's a far more definite thing for a winner to throw the loser back, broken and beaten, onto his own planet, than for his Spatials to push a senseless asteroid into the enemy's atmosphere. The latter, to us, seems utterly futile. Therefore, this is our answer to the challenge. We both will abide by a decision gained by force of Spatial arms!

JAN VAN REESE'S heart sank when he heard of the bold answer to the challenge. Mars had practically declared war. She had taken that first challenge to be a confession of weakness. She had no sense of humor, it appeared, nor any competitive spirit.

The commandant called all hands together after Mars' challenge was received. For an hour all activity at the Point ceased, while he read to the assembled command a message from the President. Then he gave all hands his view.

"We all felt, when this game of Asteroid was proposed, that it would create so much interest that peoples of other planets would see in it a substitute for war. But it appears that Mars has taken it as a confession of fear, and has boldly challenged us to combat. I think you all know what that means—direct attack on us, if we disregard the challenge. Any other answer to it, except acceptance, will be a further indication of weakness. Instead of promoting friendliness, our challenge has provoked war.

"The President, as you can tell from his communication which I have just read to you, does not see how war can be avoided. I suppose that going to war over an exciting game is as sensible as going to war for any other reason. I had intended to find out which of you first suggested this game. Unfortunately the Martians have already begun to swarm into space. They are coming so fast, they will catch us flat-footed. There is no time for complete mobilization. Even plebes will have to be used to repel them.

"It is against all reason, all precedent. But in wars of the past, men with even less background have distinguished themselves. We have no choice, anyhow. We must use every available man—at once. There is no time to be lost. Listen for your assignments. Every commissioned Spatial will proceed at D Hour to the theater of battle in space. . . ."

Thus quickly were wars brought about in 4176 A.D. Jan Van Reese held his breath, waiting to hear his own assignment. His heart hammered with excitement when he was assigned to the *Polestar*.

Perhaps it was accident, perhaps design. It might have been that the officials saw fit, in an emergency, to disregard cadet punishment in favor of placing the most efficient men in strategic positions. Parker, Cory and Cable also went to the *Polestar*.

AGAIN Van Reese found himself on the greatest of Spatials. But when formation was broken, after the commandant's talk, Van Reese faced the commandant. Standing stiffly at attention, he saluted and spoke quietly.

"Van Reese, sir, requests permission to speak with the commandant."

"All right, Van Reese, what is it? Talk fast. We can't waste time with trivialities.'"

"I proposed the game of Asteroid, sir. If any blame attaches to anyone, it should rest on me. I can't remain silent, sir."

There was a slight twitching of the lips of the commandant.

"Do you think it was pure accident, Van Reese, that made us assign you and your bunkmates to the *Polestar?* We had already traced Asteroid to its source. We knew you had proposed the game."

"But I'm not responsible for these horrible results!" said Jan. "There may be millions of men killed!"

"If you are responsible, Van Reese," said the commandant, "then it should not rest so heavily on your shoulders. For decades Mars has been a thorn in our flesh. The *Polestar* hasn't been able to make a single flight without danger of being attacked. Our other ships, wherever they patrolled or traded, were constantly menaced by Martian pirates. We've stood it patiently for years, because we shrank from the responsibility of provoking a general Spatial War.

"Now that Mars has antagonized other planets as well as Earth it is probable that the rest of the Solar System will stay out, at least until it is seen how the tide of battle goes. We should thank you, Van Reese. You started something that was inevitable, and only awaiting an excuse anyway. Fortunately Earth did not provoke this war—unless this latest 'expression of weakness' of ours started it.

"It is quite possible, Van Reese, that when you proposed this game of yours—which, by the way, suggests marvelous possibilities—that you jumped the Van Reese name to the skies. However—" his eyes crinkled in a subtle smile—"we won't tell your comrades that. We don't interfere with what they do, within regulations, even coventry. You still have your own destiny to work out."

Van Reese saluted, faced about, and went back to join his own contingent. He heard some of the plebes talking in loud voices, addressing each other, but clearly intended for his hearing.

"I'll bet White Feather begged for command of the *Polestar*, because his father,

grand-father and great grand-father commanded it. Do you think the C.O. gave it to him?"

"Maybe. Anyway, he managed somehow to get aboard her. A Van Reese seems able to sneak in anywhere, no matter what kind of heel he is."

Jan ground his teeth in impotent rage. He glared at the nearest speaker, but said nothing. Sam Parker moved forward casually. So did Cory and Cable.

For a moment, his other two roommates masked the movements of Sam Parker. There was a muffled gasp, the sound of muscle thudding against flesh. Then the little group broke apart, and the speaker had a bloody nose.

"White Feather doesn't even fight his own battles!" one of the group sneered.

CHAPTER IX

War!

A SHORT while later, Van Reese had forgotten all about the remarks he had been meant to overhear. Once more he was aboard the *Polestar*. He was not her commander this time, even by courtesy, but just one of the crew. In actual war, only officers of experience took the posts of authority.

Cadets were practically passengers, since enlisted crews were considered more expert than candidates for commission. Their positions were always held in abeyance until they proved themselves by graduating with honors from the Point.

The *Polestar*, prepared for battle, sped out into space, convoyed by her myriad escort pursuit Spatials. Hundreds of Spatials were in that convoy, covering the *Polestar* like a cloud around the Sun. Only destructive rays from enemy Spatials could possibly reach her, and she was armored against all the known rays.

Within her broad base, the emergency entrances had been made ready for instant service. Into those entrances damaged Spatials could plunge for repair, or out of the battle entirely. So large was the body of the *Polestar* that she could house a tremendous number of the pursuit Spatials. She had been designed to hold more damaged, but salvageable, ships than had ever been injured in any single space battle of the past.

The great armada, the most awe-inspiring sight in the skies, broke through the Heaviside Layer. Instantly they found themselves almost at grips with the enemy.

The Martians had traveled with incredible speed, and for an obvious purpose. They meant to join in battle as close to Earth as possible. If they won the space battle, the attack could be continued right to the ground!

Jan, of course, understood the strategy immediately, but the other Earth soldiers were not far behind. When they realized what the Martians intended doing, he saw their jaws bunch sternly. This battle would actually mean the safety or destruction of their homes.

The Martian forces appeared to have borrowed from the pages of the remote past. They were advancing in a vast semi-circle, hurling at Earth more Spatials than had ever been seen together at one time. In their bullet-shaped noses glittered the muzzles of huge guns. Many of those guns had been filched by Martian spies from the secret plans of the Nations of Earth.

Espionage, in this highly advanced age, had become intensively specialized. Through the mechanical ability of their experts, to assume the forms of Earthmen and women, the Martians had reduced the art of spying to the science of espionage. They penetrated all Earth positions, from the most important to the most trivial. More than once, Martian Spatials had landed in isolated places on Earth. After hiding their ships, they passed their spies through the mysterious Homo-transforming machines, and sent them out as soldiers of Earth, or as beautiful, seductive women. Cleverly they defied detection by constantly changing their methods, and in that way they pried many important secrets from Earthmen.

THOSE secrets were now being used against Earth. As the Martian Spatials advanced for the attack, the commandant transmitted the information to the convoy of pursuits. He had taken command of the *Polestar*.

"The enemy's weapons," he stated, "are our own weapons, turned against us. Therefore you should know their efficiency. Conduct yourselves accordingly. Those of us who are destined to die must realize that the fate of Earth rests on our shoulders when battle is joined."

He paused for a moment.

"Battle formation!" he snapped. *"Attack!"*

It was the first time any of the plebes had seen a space battle from the point of view of a participant.

The sky became a maelstrom as the vanguard of pursuits from Earth flung themselves at the Spatials from Mars. The Earth Spatials were battleship gray, while the Martian Spatials were a poisonous green. There was no chance of mistaking one's own ships for the enemy's. Even the Martians did not risk disguising their Spatials with Earth's gray. Velocities were too enormous to ask the enemy's identity before raying it.

Both sides immediately brought all their weapons into play. The Martians swiftly loosed their rays of dissolution. But they were not fast enough.

Ray detectors aboard the Earth Spatials picked up the strange vibrations on the instant. Each Earth Spatial instantaneously surrounded itself with a blanket of force lines, through which the rays could not penetrate.

Other Earth Spatials, eager to grapple at close quarters with the enemy, used their Mantles of Invisibility. That secret, so far, was known only to the scientists of Earth. Unseen by the Martians, they slipped past their own Spatials, darted invisibly among the green Spatials of the enemy.

Jan Van Reese and the other plebes were able to watch it all on the visi-panel. The

invisible Spatials still remained visible on the screen because invisibility did not remove the ships' material substance. He heard the students draw in their breaths with excitement.

One Spatial slipped under the Martian armada's forefront. Its bow angled back and forth for a moment, while dissolution rays sprayed from a dozen ray muzzles. A sector of enemy Spatials were cut in two on the instant.

Martians, squat, hairy, apelike men, came bursting from the interior of the Spatials. But they were visible only for a moment. The pressure within their bodies exploded outward against the lack of pressure in interplanetary space. Their bodies were torn into fragments too small to be seen.

Meanwhile the vast *Polestar* nosed ponderously into the thick of the battle. From its enormous base came a stream of convoy ships. One pursuit after another rendered itself invisible and slipped through the attacking horde. They sprayed the Martians with every destructive projectile known to Terrestrial science.

WHILE dozens of Martian Spatials vanished, exploded, or simply dissolved in space, Earth Spatials also suffered severe damage.

As the long moments passed, it became increasingly evident that neither side was gaining any distinct advantage. Both armadas were losing great numbers of Spatials, and each Spatial lost meant the annihilation of everybody aboard her.

The loss of life was frightful. But reinforcements would soon be swarming from Earth and Mars. Then the slaughter would become even more ghastly.

The faces of the men aboard the *Polestar* were white as sheets. Nobody had expected the Martians to wreak such havoc among the Earth Spatials. The Martians had never before engaged in battle like this. They had always preferred the swift, marauding attack and quick escape rather than to open battle for an instant decision.

"Were the Martians right, after all?" Jan wondered uneasily. "Perhaps Earth has become so decadent that my game of Asteroid really is an admission of weakness—"

But that line of thought had to be abandoned. He couldn't dare to think that way —nor was there time for thought. . . .

The main body of Martian Spatials held, poised for a concerted attack on the *Polestar*. They streaked in, risking everything to capture or destroy the master ship.

Van Reese found himself yelling into the nearest transmitter, without realizing that he did so.

"The magnetic rays! Gain control of those Martian Spatials. Build them around us in a solid globe, holding them in place with the magnetic rays. Then you can dictate terms!"

Out of what deep well of racial memory the daring idea had come, Jan did not know. His fellows turned and looked at him aghast.

In sham battles the *Polestar* has often surrounded herself with a globe of asteroids, through which nothing could pass. But nobody had ever thought of thus controlling the Spatials of an enemy. Yet those Spatials were made of metal. They were not too different in composition from asteroids.

"Nonsense, Van Reese," retorted the voice of Commandant Hervey. "We can't sort out our own Spatials. They'll become part of the globe, every last one of them!"

"Why not?" cried Jan. "Let them! The Martian Spatials will be out of action. It won't matter if our own ships are also immobilized. But first release all torpedoes. Send them far enough away so they will be outside the completed globe. Then they can streak back and destroy the green segments in the mosaic of the globe!"

He heard a gasp from Hervey, but no spoken answer. . . .

The commandant's reply was instant action. Jan felt a quiver run through the *Polestar*. He shot a swift glance at the visi-panel.

THE *Polestar* was spawning a flashing cloud of two-man torpedoes. They catapulted from the vents in all directions. But they did not attack the Martian Spatials. They had also heard the voice of Jan Van Reese. The torpedoes darted out into space the moment they emerged.

Jan kept his eye on the screen, but he was not watching the little torpedoes. He was intent on the *Polestar's* thick metal screen. Abruptly he relaxed, breathing more easily.

Bright sparks leaped high around the *Polestar*. He felt his hair trying to stand away from his scalp. His skin tingled exhilaratingly.

He switched his attention to space. Earth and Martian Spatials had converged on the *Polestar*. A quarter of a mile away, they stopped dead. Slowly, then, they began to draw around the huge ship with awesome ponderousness.

Gradually his view of space was shut off. Spatials rubbed battleship gray sides and poisonous green hulls. As the pilots fought desperately and vainly to escape this irresistible force of attraction, they swung their Spatials broadside to the *Polestar*.

Before any of the enemy thought of loosing all their destructive rays, a globe of Earth and Martian Spatials was formed tightly about the *Polestar*.

The enormous ship had become the great, shining heart of a new mass in the heavens. The globe of ships moved slowly this way and that as it responded to the eternal pull of gravity from the planets.

Through the tense silence of complete helplessness came the calm voice of Commandant Hervey.

"Destruction for one now means destruction for all. The *Polestar's* torpedoes can destroy every ship which has been rendered helpless. We will not hesitate to destroy our own ships to save the *Polestar*. Gentlemen of Mars, it is stalemate—at least until our reinforcements and yours arrive. After a tremendous and unnecessary loss of life, it will again be stalemate. I suggest that all the senior officers meet in conference for an hour, and then send a representative to discuss terms with me."

With the *Polestar* plainly in command of the entire situation, there was nothing the Martians could do but follow his suggestion. In less than an hour the reply came. The guttural voice of the Martian commander informed Hervey that he was ready to discuss terms, provided they were not too drastic. If they were, the stalemate would not be disturbed until more Martian Spatials could arrive to break it up. The Martians now held in the globe were willing to sacrifice their lives in destroying the stalemate, rather than submit to interplanetary degradation.

HERVEY ordered one of the torpedoes back. A path was opened for it through the globe. He maneuvered it alongside the Spatial of the Martian commander so their locks were in conjunction.

By the simple expedient of exchanging one of the torpedo men for the Martian commander, the transfer was easily effected. They traveled back through space to the nucleus of the strangest globe ever formed anywhere in the Universe.

Countless other torpedoes outside menaced the whole mass, capable of destroying it at a single word of command. The transport torpedo brought the Martian commander to its own compartment in the hull of the *Polestar*. Then the apelike Martian was allowed to pass between stiffly erect ranks of members of the *Polestar's* crew. The Martian received every possible military honor as Commandant Hervey escorted him to the bridge for discussion of terms.

That discussion was heard in every nation of the Earth, on every planet, by interplanetary radio. But the most incredulous listener was Jan Van Reese. He could not make himself realize that a simple suggestion of his had brought about a conference for peace. Not since Earth and Mars had first made contact had the two planets been able to meet under such favorable conditions. . . .

CHAPTER X

Peace

FOR the first time the two worlds, through their representatives, sat down at the conference table to settle their differences. No word of objection came from the General President of Earth Nations, nor from the Warlord of Mars. So it was taken for granted that any decision agreed upon would be binding on both planets.

"Well, Commandant Hervey," said Commandant Rell of Mars. "It doesn't seem that either of us has lost or won. Neither side can move one way or another without first reaching some agreement. That's what I'm here for."

Rell spoke English without an accent. Learning the major Terrestrial language was the one concession Martians had ever made to Earth. Grudgingly they had accepted speech records for use in their schools. Before long, though, they seemed eager to learn Earth's main language, and the disappearance of Terrestrial secrets had soon proved the use they had discovered for it.

The worlds fell silent, attentive. All commerce was halted.

"Just what do you propose, Commandant Hervey?" Rell asked stiffly.

"Not disarmament, for we both have other enemies," replied Earth's representative. "But some sort of understanding is needed. Perhaps through that understanding we may stand together against common enemies. Mars and Earth, as allies, can bring peace and order to the Solar System."

"Yes," Rell said, grinning uncomfortably. "Mars could do it alone—if it were not for Earth!"

It was the nearest any Martian had ever come to a joke, the first hint that Martians had a vestigial sense of humor.

"Since you sent for me, the approach must come from you," Rell added.

"We challenged you to a game of Asteroid," Hervey smiled. "We repeat the challenge!"

"But why?" Rell asked in genuine bewilment. "What's the sense of it? What is accomplished by fighting over an asteroid?"

"What is ever accomplished by war, except death to millions?"

"Decisions are always reached by war which can't be reached in any other way."

"That's where I disagree. Let us decide, hereafter, to arrive at decisions in a game of skill. All of us can play. While we are getting the full benefit of battle practice, no one runs the risk of being killed. Maybe Asteroid does sound a bit silly, but great skill and strategic knowledge will be necessary to win. Just as much skill, in fact, will be required to win a game of Asteroid as to win a battle.

"If we decide to abide by the decision in Asteroid, we can have a great deal of fun and excitement. We can be friends. Frankly, we will be able to get together oftener without having to guard ourselves with dissolution rays, rays of invisibility, magnetic rays, and the like. We'll provide entertainment—at an admission price that will be decided on later—for the whole Solar System."

RELL thought for a moment. All the worlds held their breath, waiting for the Martian representative to speak. His answer would mean peace or war. . . .

"If I refuse?" he asked instead of replying.

"My torpedoes menace every green ship in the globe about the *Polestar*. Not one of your Spatials will survive."

It seems that you have me. Remember, though—Mars is still in the ascendant if I refuse to listen to you. We can still win even if I see fit to sacrifice every man and ship now in your control, while awaiting the arrival of reinforcements. But if it hadn't been for the war pride of Mars, I'd have enjoyed accepting your challenge to play Asteroid.

"Now that the decision rests with me, I want to use my first judgment. Let us call this battle a drawn battle, so no humiliation will attach to either side. Each armada is to return to its own base, with the under-

standing that Mars is reconsidering its answer to your original challenge."

"I am sure both our worlds will rejoice. It is agreed then?"

Rell rose, grinned, stuck out his hairy hand.

"It's agreed. Now, will you show me through the *Polestar,* so I'll be able to tell my people what we're going to play Asteroid for? Then we'll know how to appreciate the sister ship of the best Spatial of Earth when we've won it for the third consecutive time."

Hervey nodded, smiling. "I'll show you through, Commandant Rell, but don't get the idea that it's going to be easy to win. As a matter of fact, I don't believe you'll ever live to see Mars win it three times in a row. We'll have the pick of Earth's Spatial pilots on our eleven."

For a moment Rell looked as though he were about to explode into anger. But his grin only broadened instead.

"And our eleven will be the pick of Martian Spatial pilots—whom I, personally, shall command. I do not see how we can fail to possess the plans when the first series ends."

"No?" said Hervey. "That is only the first leg, if you win. You must win not three games, but three seasons in a row."

Rell shrugged. "No matter. Three games. Three seasons. It is all one to Martians. And it occurs to me, Hervey, that whoever originated this Asteroid idea is a master diplomat and an even greater strategist. He made us think Earth had become weak, to propose games instead of war. He trapped us into this stalemate and agreement not to fight. Who is he?"

ALL Earth, all Mars, every Spatial, heard the quiet answer of Commandant Hervey.

"The game of Asteroid was adapted from our ancient game of football, by the present representative of a famous family—Jan Van Reese. In all probability he was born a master strategist. Unfortunately, right now, he is in the bad graces of his fellows. Coventry, we call it, because the last time the *Polestar* was out, and we were attacked by meteors—"

"I planned that attack," said Rell. "But continue, please."

"Jan Van Reese was at the controls. He grew frightened and retreated, leaving all the pursuits of his convoy to be destroyed."

"And he retreated, you say? Dived out?"

"That's right."

In silence the crew of the *Polestar* watched the visi-panels. Until then Rell and Hervey had been making admirable progress. But the crew went white-faced. The Martian commander had turned livid with fury.

"Blast it!" shouted Rell. "I wish I had known that before we reached an agreement! Our spies have failed in their duty."

"What do you mean?" Hervey asked in alarm.

"I guess it doesn't matter if I tell you, now that we are diplomatic friends. Our scientists have invented a ray which picks up the control element of enemy Spatials and renders unconscious the man in control. It's not perfected as yet. When you fainted at the controls, every living person on the *Polestar* would have fainted at the same time, and the ship would have been helpless. As far as we could tell, this new ray had no effect whatever.

"If I had known that it did affect the person actually exercising control, then our scientists could have perfected it. Next time we met, Hervey, our Spatials would have utterly destroyed yours. We would have done so the last time, if the *Polestar* had not cut and run!"

There was a moment of intense silence. Finally Rell laughed.

"However, perhaps all is not lost. We can use the ray to make your players faint, and we'll win every game! So, Hervey, in three years, prepare to see the *Polestar's* sister ship on Mars—where it will probably remain until it falls apart. By the way, how about the young fellow who thought up the game of Asteroid? Why can't he be assigned to the new ship when we've built her? We can use a master strategist when and if we have to go to war with Pluto, Uranus, or Jupiter."

"Sorry, Rell," said Hervey. "By that time Reese will have graduated from West Point. He will already be in command of the *Polestar,* perhaps for all the years that Mars fails to win at Asteroid."

LISTENING incredulously, Jan Van Reese felt a huge lump clog his throat. A great hand smashed down on his back, almost breaking him apart. Sam Parker, without a word, had merely expressed his delight at the sudden turn of events.

Peter Cory stepped up to Jan. He grasped him by the aching shoulders, lifted him off his feet. He held him close—like a great dog regarding a captive bird. Looking into Jan's face, he shook his head.

"Yeah, it's the same Van Reese, I guess. From coventry to the greatest name in the Solar System, at one jump. Pretty good, I'd say! Especially for a shrimp, a little runt—"

"Suppose," said a strange voice, "we all get a look at him."

Jan turned to look into unfamiliar faces. Scores of cadets had crowded around. All of them were grinning at him. But he saw their grins only through a mist of tears. Things had happened too fast for him, too unexpectedly.

The *Polestar* returned to her berth. All West Point, all Earth for that matter, was talking of the forthcoming game with the Mars eleven. Even then he found it hard to realize that a man might rise from the lowest depths to the very stars in a few short months—if he never for a second lost his courage.

Next Month's Novel: THE WORLDS OF TOMORROW
by Manly Wade Wellman

THE STOLEN SPECTRUM

By
OSCAR J. FRIEND
Author of "The Impossible Highway," "The Kid from Mars," etc.

Roy G. Biv Brought a Science Spectacle to the World's Fair—the Strangest Show on Earth!

IT was Kay Lowderdale who first noted the cyclotron item in the paper. She pointed it out at the breakfast table, brushing her toast aside.

"Dad! John!" she exclaimed. "Look at this!"

Professor Lowderdale glanced at the news article and then passed the paper along to John Barbour, his electrical assistant. Barbour read the account aloud.

Like a soldier the man walked into the yellow column, unhesitatingly

ATOM SMASHER SMASHES LABORATORY

Schenectady, N. Y.—At eight o'clock last night the million-dollar cyclotron just completed by the Consolidated American Electric Company for the breaking down of the atom staged a private breakdown of its own. The machine had been in operation about ten hours, according to Dr. Wolsheim, when something went wrong in its complicated interior. Without warning, there was a sudden flash of bluish fluid, a thunderclap of sound, and the cyclotron went dead, fusing itself in a ruin of molten metal and shattering every window in the huge laboratory.

Fortunately, nobody was on that floor of the building save Dr. Wolsheim and one visitor, Mark Townley, who was interviewing the physicist about a series of radio broadcast articles. Both men were at the opposite end of the room at the time of the explosion. Neither was touched physically, thanks to the heavy sandbag insulation, but Townley was knocked unconscious by the electrical discharge. In some inexplicable manner he acted as the lightning conductor for the two-million-volt bolt. Even the stitching in his shoes was ripped out by the freak accident.

Townley was removed to St. James' Hospital where, according to latest report, he had regained his senses. He was unable to make a statement, attendant physicians advising that he is being treated for both amnesia and aphasia.

"Amnesia, I know," said Kay, as Barbour finished. "That's loss of memory. But what is aphasia?"

"Loss of the power of speech without impairment of the vocal organs," explained Barbour. He was always explaining things to Kay, a by no means unpleasant task.

"Isn't that a queer sort of condition?" the girl asked. "Amnesia and aphasia at the same time?"

"Decidedly so," answered her father, nodding. "I never heard of such a combination. I'm sorry to learn of the cyclotron's failure. I know Wolsheim. Remind me, John, to write him a note."

"Why don't you tell Wolsheim how to do it?" Kay pursued, wrinkling her brow prettily. "Or is your new process still a secret?"

"It isn't the same thing, Kay," said the professor, smiling.

"I don't see the difference. That cyclo-thing tears down the atom. And your machine for the transmutation of matter has to reduce the atom to electro- or magnetic energy, too, doesn't it?"

"To the casual observer," Barbour put in, "the two things are the same. True, both methods reduce the atom, but not alike. The transmutator changes material substance into a special short-wave form of energy so that it can be transmitted across a carefully estimated gap to a special receiver. There the process is exactly reversed and the object materialized in its former precise arrangements of atoms and molecules.

"The cyclotron breaks down the atom to release its inner and potential energy in a different and usable form, transmuting one element into another in the process. In other words, it's like one and three make four, and two and two make four. The numbers add up to the same thing, but they are not the same."

"I don't get it," said Kay blankly.

BARBOUR smiled warmly.

"At least, you understand," he began, in his best academic manner, "the experiments we have been conducting with our two synchronized transmutators. We place a block of wood, a piece of fruit—or any sort of material within the column of light force—on the dais of one machine to see it disappear and then materialize upon the dais of the other. You can see what revolutionary things are probable when we get to producing the transmutators on a commercial scale.

"The transportation of freight and goods of all kinds between distant points will take place in the twinkling of an eye, without handling costs. It will—"

"It would be nice, I'll admit," interrupted Kay musingly, "if you could transport people from one place to another. Just think how nice it would be for an old lady who gets train-sick simply to step onto the transmutator's dais here in New York and draw a deep breath—and exhale that breath on the dais of the transmutator out in Indiana where she was going to visit her daughter. Or for a child who needs an emergency operation to be wheeled onto the dais in Arizona and instantly wheeled off a dais at Roches-

ter, Minnesota. But, no! All you can do is to move a fragment of still life from one metal plate to another plate not fifty feet away—and it takes a hundred thousand dollars' worth of scientific equipment to do that!"

"What you visualize, my child, will come," Professor Lowderdale spoke up mildly. "Unfortunately, the three small animals we tried to send across the tiny gap of infinity died, but with time for research—with John's brilliant mind to aid me—I shall succeed in transmitting living matter yet."

"If it can be done, I know you two will do it," agreed Kay loyally. "But where are you going to get the money to carry on such costly experiments?"

"Just wait until our exhibit is finished next month at the World's Fair," said Barbour stoutly. "One season's showing there of what we have already accomplished—at a small admission charge—and we'll secure plenty of financial backing."

"A Coney Island sideshow!" exclaimed Kay in distaste. "I bitterly resent the idea of having to put a scientific achievement on a midway as—as a cheap amusement."

"It isn't going to be a cheap sideshow, my dear," interposed the professor mildly. "The Fair corporation is giving us a dignified and splendid setting right in the heart of the scientific and industrial exhibits. You'll be proud of it."

"And we are already getting lots of priceless publicity in the papers," added Barbour enthusiastically. "You just wait, Kay. Give us two more years, and you'll see that train-sick old lady off to Indiana yet."

It was two weeks later, on the eve of the opening of the second year of the World's Fair, that Professor Lowderdale had a visitor. He was a slender, alert looking man of indeterminate age, neatly attired in a smartly tailored suit.

"Permit me," he said in a precise voice when he was shown into the professor's study. "My card."

With a very slight flourish he bowed, smiled, and presented a finely engraved card.

The professor looked at it.

ROY G. BIV

Astral Physics & Mathematics of Light

THE professor looked up thoughtfully at his caller. The name was an odd one, almost Slavonic or clipped Russian, but the man himself looked typically American. His speech was unaccented and his English was choice. Everything about him seemed perfectly normal, but the secondary line on the stranger's card almost smacked of charlatanry.

"Yes?" Lowderdale said sharply. "What can I do for you, Mr. Biv?"

"You mean, what can *I* do for *you*," corrected Roy G. Biv gently. "Or, to be more exact, what can we each do for the other. I have been following the newspaper articles about you and your transmutator with a great deal of interest, Professor Lowderdale. Frankly, I am asking you for a job. I'd like to be your assistant."

"But I have an assistant, a very valuable young scientist by the name of Barbour," began the professor. "Besides, I don't think I could afford—"

"Ah! But you do not have an assistant such as I," interrupted Mr. Biv politely. "I do not mean to replace Barbour, and you need not worry about remuneration. That trifle will never trouble either of us, I assure you. So that is what you can do for me. In return, what I can do for you—after I examine your equipment—will be to enable you to transmute living human beings from one of your machines to the other."

"What?" exclaimed the astounded scientist. "But that's impossible."

"Not at all," replied the confident Mr. Biv easily. "I have the proper formula here"—he tapped his forehead lightly—"and I feel certain I can make a few adjustments in your present apparatus which will cause it to function perfectly. It will only take a little time. The expense will be practically negligible. Will you let me accompany you out to the Fair grounds where the estimable Mr. Barbour is supervising the installation of your re-

markable scientific paraphernalia?"

This was an amazing offer, and Roy G. Biv certainly showed no signs of being a crank. However, Professor Lowderdale was too canny to let a perfect stranger start monkeying around with the result of years of painstaking labor. So the professor started talking physics and electricity at a rapid rate, purposely making an obscure misstatement of facts.

To his unbounded astonishment, Roy G. Biv not only corrected him instantly to the tenth decimal place, but was far ahead of him in the problem he propounded. Biv launched into a technical discussion of light equations and laws of physics which actually strained the professor to follow.

"Come on," said the professor, convinced, putting on his hat. "Let's go."

At the Lowderdale exhibit at the Fair grounds Roy G. Biv did nothing phenomenal. He acknowledged the introduction to Barbour and to the professor's daughter with just the right amount of friendliness and then followed the professor around and listened and looked intently as Lowderdale explained things to him. When they were ready to return to the city in the evening he took his leave of the trio on the understanding that he appear for collaborative work with Barbour in the morning.

"Isn't he charming?" said Kay enthusiastically.

"I don't like him," said John Barbour shortly.

"Why not?" inquired the professor.

"I don't know," the younger man admitted frankly. "Somehow, his face looks familiar to me, but I can't place him. I never heard that name before, though, I'm sure."

"There is no doubt that the man is brilliant," said the professor. "I am ashamed to confess that he knows more science than I do. I'm sure he will be able to transmute living things. Do not resent him, my boy. Work with him."

LOWDERDALE'S faith was well founded. Work went on briskly at the exhibit. The Fair opened on schedule, but the Lowderdale equipment was not ready. Roy G. Biv's main contribution to the work was to listen intelligently to Barbour's directions and then supervise the work of the men under him, seeing that they followed the plans exactly.

One day, about three weeks later, at the professor's home where he experimented every afternoon with the original small models, Roy G. Biv called all three of them in to watch him send a live white rat from the dais of the first machine to the dais of the second. There was no trickery about it. He actually did it.

The rat's outlines blurred in its cage, just discernible within the shaft of yellowish light that rose vertically from the metal plate of the platform. The cage blurred at the same time, then grew transparent, nebulous, and finally winked out of existence—only to reverse the process and rematerialize within the shaft of light which pulsed upward from the second machine across the room.

Smiling triumphantly, Roy G. Biv flipped off the switches and pointed. The white rat was alive and none the worse for its journey through the miracle of reintegration!

"You've done it!" congratulated the professor and the girl as they examined the rat.

Even Barbour had to nod his head in admiration. Methodically the young scientist began to go over the transmutators, but he could not determine just what changes Biv had made.

"Yes," said Biv calmly. "It was comparatively simple. Now to make the necessary adjustments on the large transmutators Barbour is installing at the Fair. In a short time you will be able to transmute human beings at the exhibit from one spot to the other safely for a nominal fee which they will gladly pay for the experience and thrill. Perhaps, before the season is over, we can install a transmutator at the San Francisco Fair and send people from one Fair to the other."

Biv spoke in such glowing terms that he carried Kay away and even succeeded in warming the cooler John Barbour. Now things underwent a subtle change. While Professor Lowderdale remained the head of the exhibit and Barmour remained nominally

in charge, Roy G. Biv actually took charge of the work. Machines were changed, rheostats shifted, a huge dynamo installed—all according to his specific directions.

John Barbour kept insisting to himself that he was not jealous, not disgruntled, but he still couldn't warm up to his co-worker. Yet he kept his mouth shut. He did not even ask why Biv ordered the construction of a large platform with steps at both ends out in front of the exhibit building.

"We shall give free and public demonstrations," finally explained Biv. "We will invite spectators to mount the dais where a huge transmutator will be functioning. They will find themselves transported into the exhibit building and onto the reciprocating dais inside."

There were more tests with various animals on the small transmutators in the professor's laboratory. Then came the day when the two large transmutators in the exhibit building and the huge one out in front were completed. There remained only the final tests.

AFTER sending a number of articles and small animals from one to the other of the reciprocating machines in the hall, Roy G. Biv announced that there remained only the supreme test. The transmission of a human being.

"Who will be the first person to make the test?" Biv asked. "This is really your discovery, Professor Lowderdale, and it is your privilege to decide."

Lowderdale hesitated.

"I am as confident as you that it will work, but we must have a willing subject to make the first trip. We do not know if transmutation will affect the mentality of a subject, so we cannot ask a stranger to submit to the experiment. I—suppose I should make the first try myself."

"No," said Barbour. "You are too valuable, sir. Since there is the mental risk to consider, I volunteer to undergo the experiment."

Roy G. Biv smiled and waved his hand in dismissal of the idea of danger.

"Gentlemen," he said, "I am so positive that there is no risk that, since we must make a choice, I insist upon being the first subject."

He resolutely shrugged aside all other suggestions, and finally the others agreed. A moment later Roy G. Biv calmly stepped into the shaft of energy which shot upward from the sending dais. He disappeared. Then, while all eyes strained at the column of bright yellow flowing up from the receiving dais, his figure slowly took form, solidified—and he stepped briskly down from the metal plate, none the worse for the revolutionizing experiment.

The Lowderdale transmutator was ready to be shown to the world!

Barbour approached Lowderdale.

"I want to be the first to congratulate you, sir," he said. "This is all your work. Biv just speeded things up for you."

"Nonsense!" said the professor. "You are as responsible as I. We shall all three share the glory. This is actually the greatest day of my life. We must have a celebration."

Roy G. Biv nodded, patted the professor on the back.

"There remains only to synchronize the extra large transmutator outside with one of these machines in here," he said, "and we will have a perfect set-up. I shall attend to those final details tomorrow. This will be the biggest sensation of the Fair!"

Later, Barbour voiced his growing uneasiness to the professor.

"I don't quite like that third transmutator out in front," he said. "What's it for?"

"Sheer nonsense, my boy!" said Lowderdale. "It is stupendous. Biv is right; this will be the sensation of all time!"

Nevertheless, Barbour could not shake off his worry. Because of it he was at the exhibit the following morning at dawn. He found the place deserted—until he went inside. There, to his growing horror, he saw Johnson, one of the more intelligent of the electrical helpers, lying in a crumpled position at the base of the right-hand transmutator.

He hurried forward, bent over the man. Johnson was dead. In the middle of his forehead was a round, red

blister the size of a quarter. It looked as though somebody had burned Johnson with the glowing end of a huge cigar. There was nothing in the building which could normally have inflicted such a burn. And what had the fellow been doing here, in the first place?

By a swift examination Barbour estimated that the electrician had been dead about three or four hours. Sick at heart, the young scientist called the police and then notified Professor Lowderdale. Roy G. Biv arrived about the same time as the police. He was coldly surprised at the tragedy and quite annoyed at the entire business because it interfered with the work on the transmutators.

FINALLY, after a lot of questioning which revealed nothing, the police removed the body for an autopsy. The unfortunate matter was hushed up to avoid spoiling the opening of the exhibit. But Barbour could not dismiss the puzzling business so lightly. He went to the medical examiner's office to inquire.

"A most remarkable thing, Mr. Barbour," he was told by the confounded post-mortemist. "The entire internal structure of the body looked as though it had been cooked."

"Cooked?" repeated Barbour in disbelief.

"Exactly," said the medical examiner. "It's the most inexplicable thing I've ever run into. The flesh and vital organs showed unmistakable signs of being subjected to intense heat."

"You mean the man was—electrocuted?"

"He must have been, but I don't mean exactly that. I've examined electrocuted bodies before, and I never saw one like this. This man was partially cooked through and through. The only external sign was that burn in the middle of the forehead. I don't know what kind of apparatus you have out there in your exhibit, but I'd say this victim was killed by some sort of infra-red process that just about parboiled him."

"Thanks," said Barbour, shaking his head in bewilderment. "I'll make a careful checkup, of course."

Barbour was sure he wouldn't find anything, but he was thinking about several queer machines which Roy G. Biv had made himself or had had made. Machines which had not yet been explained to anyone else or even put into use. And that haunting familiarity about his amazing colleague worried him more than ever.

By the time he got back to the exhibit building he was forced to forget the sordid mystery for a time. A stream of people were crowding into the place for a demonstration of transmutation. The building was jammed, and Professor Lowderdale had already talked himself hoarse, lecturing. Roy G. Biv was working madly with the machines, trying to keep pace with the professor and keep up with the crowds. Hundreds of applicants volunteered to go through the transmutators. At one side stood the twenty or more who had already undergone the unique experience.

Barbour stepped into the gap just in time to relieve the professor and take over. By midnight a cordon of police was required to clear the building so they could lock up for the night. The matter of the electrician's death had faded into insignificance.

Because of the excitement and the crowds a guard of soldiers was established around the building. Biv decided to spend the night watching the equipment and connecting up the huge transmutator which stood outside. Barbour saw the professor and Kay home where they sat up until nearly morning making plans for better facilities in handling the crowds, printing pamphlets and doing the dozens of little things they had not yet had time to see after.

The following morning two plainclothes men, a lieutenant and a sergeant, called at the exhibit to interview Roy G. Biv.

"We won't take up too much time," apologized the lieutenant. "But see here, Mr. Biv, we have checked up on you as a matter of course, and we find your name is not Biv at all. You are Mark Townley of Schenectady, New York!"

Something clicked in Barbour's

mind. Of course! He had seen the radio interviewer once at a broadcast program. No wonder Biv had looked vaguely familiar to him. But Townley had not been an expert on electromagnetic science, and Biv was a wizard at it!

"That's true," admitted Biv coolly. "When I left the hospital I came to New York and changed my name for the time being. Is there anything wrong with that? I am not the first person to use an alias."

"But—but you left the hospital while still suffering from amnesia and —and loss of speech. What is—I mean, don't you know you're a sick man? Don't you want to go back home?"

"What for? I'm busy here covering the greatest scientific feat of the past five hundred years. I am perfectly well. Thank you, however, for your good intentions."

ASIDE from the fact that his eyes were red-rimmed from lack of sleep, Biv's statement was obviously true. The two plainclothes men seemed at a loss for further words. After a couple of perfunctory remarks the detectives withdrew, and the others turned to Biv for an explanation. Professor Lowderdale seemed interested in the cyclotron explosion.

Biv, or Townley, had little to add to the newspaper account they had already seen. He told them that he had recovered from the physical shock within forty-eight hours, had quietly got up, clothed himself, and walked out of the hospital. Going to his hotel, he had packed a traveling bag and come to New York where, after several days, he had approached the professor for this present job.

It was so astonishingly simple, Barbour wanted to inquire further, but Biv pointed at the clock.

"There's nothing else I can tell you, but I'll discuss it with you people later. Right now, we're ten minutes late in opening the exhibit. Today is the big exposition outside."

He was right. An enormous crowd was milling around and pressing forward to view the big free demonstration which had been promised. People were standing in line to mount the steps and pass into the column of light, then to disappear and be materialized on one of the metal discs of the transmutators within the building.

Roy G. Biv took charge of things at once in a crisp and efficient manner. He made a creditable address to the throng, sketching a brief history of the Lowderdale transmutators, picturing a marvelous future for mankind, and then launched into a brief description of the mechanics of the invention.

Then, while people thronged into the building to watch the materlization of those who were ready to march up and enter the energy column on the platform outside, Biv spoke into his telephone mike behind the platform to the waiting professor.

At once there was a crackling sound in the base of the huge dais, and a mighty column of yellow light, like a great shaft upholding the sky, sprang into being. It was a cylinder of light that was fully five feet in diameter.

Then Biv motioned to the first man in the waiting line, a fearless newspaper reporter. Like a soldier—having seen the demonstration inside the previous day—the man walked without hesitation into the yellow column. His figure blurred and disappeared in a sort of spinning motion, winked out, and then returned into blurred view on a larger proportion. It was as if his body had expanded or distorted.

And then before the eyes of the gaping spectators he calmly stepped out of the opposite side of the shaft of transmutator energy and started down the second flight of steps! John Barbour stared, going rigid in stunned surprise.

For the figure he saw striding down the steps was not that of the newspaper man! Evidently something devilish had gone wrong with the transmutator. By all rights the subject should have vanished, to reappear on a transmutator disc within the building. Instead, a monstrosity had emerged from the column. It was the figure of a man in crimson tights.

The creature was fully eight feet tall and had a hairless, dome-shaped head. In each hand he gripped what looked like a red-metal ray gun of

some sort. Nor was this the crowning horror. Even the flesh of the Gargantuan nightmare was a livid red hue. A creature from hell!

THE crowd stared, and roared with laughter. They thought it was a show put on for their benefit. The line of people waiting to walk into the column of yellow energy could not see what was emerging on the opposite side, and they moved forward like eager automatons. Three of them had disappeared and a fourth, a man from upstate who still carried his suitcase, was entering the column before Barbour recovered sufficiently to move.

Just what was happening he did not know, but it was distinctly not a hoax. It simply couldn't be a show. Turning, Barbour fairly fought his way back into the building.

"Shut the power off, Professor!" he shouted. But his voice was lost in the noise of the roaring crowd.

Professor Lowderdale was staring at the dais which should have been in synchronization with the huge column outside. But the transmutator was dead and lightless. And still the fools outside were feeding themselves into that infernal shaft like bugs into a hopper, to come out as grotesque and horrible caricatures of giant men.

Desperately John Barbour wriggled and squirmed his way through the crowd. Panting, disheveled, breathless, the young scientist reached the side of the anxious professor just as a voice boomed out over the loudspeaker system.

"People of Earth," it said—it was the voice of Roy G. Biv—"you are beholding men from the fifth dimension, a realm which lies on a plane parallel to this three-dimensional planet. This shaft of light is the gateway, a connecting doorway, so to speak, between the two worlds, and as visitors pass through from Earth their places are taken here by men of Derk. As we are receiving these envoys from Derk, the Derkians are receiving in exchange visitors from Earth.

"There is one major difference in the two dimensions. The fifth dimension lies in a plane of astral mathematics where that interesting phenomenon you know as the spectrum of light does not exist. That is to say, of the sixty-odd octaves of light or electromagnetic rays, ranging from the slow long-wave oscillations of eighty-five up to the incredibly short-wave lengths of one hundred quintillion frequencies which lie in the realm beyond the gama rays, Derk does not advance beyond the infra-red.

"In short, in the fifth dimension there are no ray frequencies above the thirty-ninth octave. The phenomenon of what to you is visible light lies just above the frequency plane of the fifth dimension. It is such a small span—only one meager octave—but what a vast difference it makes in the cosmos of the two worlds!

"That is why these visitors appear red to your optical sense. Have pity on them, for they are temporarily blind in this world that is as strange to them as they are to you. They have come to Earth from the infra-red and—"

There was a terrible scream in the voice of a woman, a scream which was taken up by hundreds of men and women alike as a great fear swept over the crowd.

"What is it? In God's name, what is it?" cried Professor Lowderdale, clutching at Barbour's shoulder. "And where's Kay?"

Barbour tore himself free.

"Wait here!" he shouted in the older man's ear. "And shut off that—no, wait! Wait while I see."

Barbour fought his way back to the entrance and stared over the heads of the crowd. He couldn't see Roy G. Biv in his cubicle just behind the platform, but he saw enough to freeze his blood in horror. A full dozen of the crimson monstrosities were herding people up the steps and into the transmutator column of energy. They were using their ray pistols to terrible purpose. More than a score of people lay lifeless—all but incinerated—on the ground.

PEOPLE were fleeing in all directions, but a goodly fifty or more had been corralled and were being thrust one by one into the gateway which Biv had stated opened on the

sinister fifth dimension. Kay Lowderdale was not in sight.

Groaning in despair, Barbour fought fought his way back from the entrance of the building and made his way to the switchboard where the professor stood helplessly waiting.

"Shut off the power!" Barbour cried. "Stop it! Wreck the machine before it is too late! Blind, my eye! Those demons can see—or they don't even need eyes. Turn off the juice!"

Hurling himself forward, he threw the main switch just as a red-hued Derkian came shouldering his way into the building to point a deadly ray gun at the young man. Grabbing the dazed professor about the waist, Barbour toppled them both to the floor just as the ray gun hissed luridly. A projectile of red flame lashed out and flared against the great switchboard where the two men had just been standing.

There was a blinding flash, the instant smell of burned insulation and melting metal, and the control panel of the Lowerdale transmutators fused into a twisted, blackened ruin. The gateway to the fifth dimension had been thoroughly sealed.

"That devil did a better job of it than we could have," panted Barbour. "Now we've got to get hold of Biv before he can build another."

"But—but what about these monstrosities?" faltered the utterly demoralized professor.

"We'll have to leave them to the police. Biv is more important."

Which was true. From the loudspeaker came a roar of strange words in Biv's angry voice which had a queer effect on the advancing red giant. He stopped abruptly to listen, and then turned to hasten back toward the entrance.

And in that ugly moment a greater tragedy befell. Some of that queer machinery Biv had installed and which Barbour had not had time to examine suddenly came to life, operated, obviously, by remote control by Roy G. Biv.

All at once—just like the snap of a finger—the light went out of the air! Just like that! One moment it was daylight outdoors and electrically lighted within. The next, it was pitch dark everywhere. It was not the blackness of night where there is a great deal of subdued lighting from stars, from radiation, from man-made luminaries. It was the darkness of eternal night.

Frantic cries now arose from all over the Fair grounds. Sobbing breathlessly, Barbour struck a match. He heard it flare, he smelled the sulphur, he felt the heat—but he could not see a thing. It was ghastly!

"Infra-red. Infra-red," Professor Lowderdale was saying. "Roy G. Biv has somehow managed to blot out the octave of light. He has stolen the spectrum! We are blind and helpless —while those demons can see."

"Infra-red! Sure, that's what killed Johnson!" cried Barbour. "I understand it now. Last night Biv must have been secretly experimenting and Johnson caught him at it. He must have killed Johnson with an infa-red ray."

"I see it now," said Lowderdale. "It's a compensating arrangement to keep the two dimensions in balance. For every red devil who comes through, an Earthman has to go the other way."

"OF course!" whispered Barbour, his lips close to the ear of the man he could not see. "That's why they were herding humans into the transmutator. Biv set his fiendish machinery in sychronization with the fifth dimension. But how could he have known to do so? Why did he do it?"

"Never mind that now," said Lowderdale. "He duped me completely; I admit that now. But we've got to do something about—I have it, John! How's your sense of direction? Can you lead me to the office where I left my little satchel this morning?"

"Y-yes, I think so, by following the wall. If we don't run into one of those Derks. But why? What have you in your satchel that will help us in this mess?"

"A camera," said Professor Lowderdale. "In the carrying case there is an infra-red lens. If we get our hands on that, we can see!"

"That's a possibility!" exclaimed Barbour. "But what good will one eye goggle do at a time like this when we need a dozen lenses for armed policemen to wear?"

"Have you forgotten that the Eastman Kodak building is less than a hundred yards away?" asked Lowderdale. "With my one pitiful lens to guide us, we can equip ourselves well enough to see, and—"

Barbour abruptly pulled his companion to his feet. No further explanation was necessary.

"Come on," he said. "And for heaven's sake, don't let go my hand!"

They made a journey through a Stygian bedlam that John Barbour never forgot. But it was successful. With that pitiful little infra-red lens from the camera case, they found that one of them could see in a distorted fashion through one eye at a time. It was a crazy world of dim light and weird figures they gazed upon. But with Barbour peering and leading, they negotiated the distance from the

(Continued on page 126)

HEADLINERS IN THE NEXT ISSUE

COME to the Interplanetary Fair! Every inhabited world is represented — Mars, Earth, Venus, the Jovian satellites—upon the midmost moon of all. Come one, come all! Welcome to Ceres and the Pan-Stellar Exposition, where all the wonders of all the worlds are marshaled for you! Come by private rocket. Come by liner. Come by special Fair caravan. Come see—THE WORLDS OF TOMORROW!

Yes, come visit the Fair of the future, thirtieth century style, in Manly Wade Wellman's streamlined story of man's playground in space. His novel, THE WORLDS OF TOMORROW, is the story of a rich man, a poor man, a beggarman and a thief who *did* come to the Fair of the Worlds. You'll find this great story published complete in the October issue of THRILLING WONDER STORIES, featured in our special scientifiction novel section. Illustrated by Wesso!

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NEXT month brings you Pete Manx's first novelet! Kelvin Kent pole-vaults the incorrigible century-spanner into prehistoric climes in a new scientifun fantasy, MAN ABOUT TIME. Piltdown Pete chisels a page from stone-age history when he breaks the chain of the centuries—and finds the missing link!

* * * * *

CAN you visualize a "sea-rush" of the future? A time when man, driven from the land continents by vast dust-bowl blights, will make toward the oceans for habitation.

There's gold in the sea—and a hundred other elements. And Arthur K. Barnes, in his novelet, WATERS OF WRATH, shows us how science begins the conquest of the deep in an effort to wrest these riches from the oceans. It's a thought-provoking story of a floating empire!

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IF YOU'RE one of the few T. W. S. followers who has never read a "Via" story, then here's your chance to get in at the start of a brand-new series! In next month's issue Gordon A. Giles narrates the thrilling argosy of Mercury Expedition No. 1, a band of interplanetary pioneers who are the first to explore the Solar System's inferno planet.

VIA MERCURY is the first of a three-part series. Don't fail to get in on the ground floor. You'll be startled by the exploits of the men who map the skies!

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POPULAR mystery story writer, Frank Johnson, wins the cover illustration next issue for his distinctive story, COLOSSUS FROM SPACE. Only a miracle could save the world from destruction—and then it came—from another world!

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OTHER fine stories by favorite fantasy authors in the October issue of THRILLING WONDER STORIES. And our regular parade of exclusive features. SCIENTIFACTS, SCIENCE QUIZ, STORY BEHIND THE STORY, LOOKING FORWARD, SCIENCE QUESTIONS AND ANSWERS, and many others. And remember—there's a long complete scientifiction novel in every issue of THRILLING WONDER STORIES!

NEXT time you flop on one of our monthly Science Quiz tests, don't feel too badly. For even the biggest scientific minds in the country can be stumped when it comes to answering certain technical posers!

It happened when several prominent experts were brought together at a recent banquet sponsored by General Motors at the World's Fair. Among the celebrated scientists present were Dr. Karl T. Compton, president of the Massachusetts Institute of Technology, Dr. Ernest M. Hopkins, president of Dartmouth College, and Charles F. Kettering, famous scientist and vice-president of General Motors.

"There are twenty-five things I would like to know," Mr. Kettering told the assembly. "What is friction? How do catalysts work? What is energy? What are enzymes? What is electricity? What can be done with chemiluminescence? What is the nature of light and other electro-magnetic waves? . . ."

Yes, the experts were stumped indeed as Mr. Kettering went on with his list. Science is wonderful, but it doesn't tell us all the answers. Only the future can do that!

TRIBUTE TO GENIUS

A prophet is not without honor, save in his own country. Thus speaks an old adage. But the descendants of Leonardo da Vinci are finally refuting that statement. (Readers of M. W. Wellman's "Twice in Time," note!)

More than 400 years ago Leonardo da Vinci constructed models of an airplane, steam cannon, high explosive shells, a hydrometer and portable bridges, amid the ridicule of Milanese neighbors.

At last the citizens of Milan have done something about it. A set of 175 such models have been collected and the whole collection has been sent to New York, for exhibition purposes.

Drop into the Museum of Science and Industry one of these afternoons and marvel at the wonders Leonardo da Vinci foreshadowed four centuries ago!

THE FAIR OF THE FUTURE

Next month's feature novel by Manly Wade Wellman, "The Worlds of Tomorrow" could have been called "The Fair of the Worlds."

For Wellman's novel is a graphic account of the first interplanetary fair, held on the asteroid Ceres. To this playground in space flock the inhabitants of the nine different planets. And, among them, a rich man . . . a poor man . . . a beggar man . . . and a thief.

Don't be impressed by the Futurama at the World's Fair until you see what science can do a thousand years from now at the Fair of Tomorrow!

WAS IT IMPOSSIBLE?

Great oaks from little acorns grow. And an innocent joke can produce an important scientific discovery.

A current scientific magazine carries an interesting story on how the process of frosting electric light bulbs was discovered. The problem was a "gag" piece of research assigned new apprentices in one big electrical equipment company. The assignment was an "impossible" one, given to all new recruits as a sort of hazing routine.

One researcher failed to realize he was being kidded, that no one really expected him to achieve any results. He went to work and turned up a process which not only did the trick but added materially to the finished bulb's strength.

Our science fiction writers ought to tell the big science industries that nothing is impossible!

"SERENDIPITY"

Did you know that a great many scientific discoveries are really the results of an accident? Men with keen powers of observation are continually finding something important other than for which they were seeking.

The discovery of the X-ray, the vulcanization of rubber, the stethoscope, the first aniline dyes, and even the pendulum, are all the results of such accidents. And there are hundreds of others on record.

The word "accident" is not the appropriate one to use in such instances, and science has just adopted a new term to describe such discoveries. That word is—"serendipity," and it was coined by Horace Walpole who says that he formed it upon the title of a fairy tale, "The Three Princes of Serendip," the heroes of which "were always making discoveries, by accidents and sagacity, of things they were not in quest of."

Accident is the mother of invention!

MERCURY-BOUND!

Follow the startling chronicle of the men who map the skies!

Next month's issue of THRILLING WONDER STORIES brings you "Via Mercury," the first in the new series by Gordon A. Giles featuring the exploits of Mercury Expedition Number 1.

Ten men rocket off from Earth on this hazardous journey. Captain Atwell's main hope is to keep his heroic band intact—to return to Earth without a single fatality. Which of the ten men will have to sacrifice their lives in the venture? Five men found graves on Mars, four on Venus. How many of these men on Mercury will have to make the supreme sacrifice? Perhaps the answer will surprise you.

Incidentally, you ha' better reserve your next three issues of T.W.S. right now. For so great is the suspense in Giles' latest series that we have determined to schedule his trio of yarns in consecutive order.

As a special feature in connection with this popular series, Artist Wesso has prepared a series of ten portraits depicting each of the characters in the crew of Mercury Expedition No. 1. *They'll* be seeing *you* next month!

THIS MONTH'S COVER

That's a fine, eye-arresting cover we have gracing this month's issue of T.W.S. The lad responsible for the visual feast is E. K. Bergey—and we're proud of him!

The cover, of course, is based on Oscar J. Friend's story, "The Stolen Spectrum," and illustrates a phenomenon in atomic transmutation. When Mr. Bergey read the story he was all for the invention described by Friend. Being a resident of Philadelphia, Bergey thought it would be fun to step on a platform in his home and broadcast himself to our offices in New York, all in the twinkling of an eyewink.

Yes, it certainly would be convenient. But then, he'd rather spend the time consumed commuting by reading the latest issue of T.W.S., his favorite magazine!

AMATEUR STORY CONTEST

Everyone's been participating in our amateur story contest! Have you sent us your first scientifiction story yet? Write up that pet interplanetary or time-traveling theme you've been hoarding all these years before some other author scoops your idea. Type it up, double-spaced, and send it to AMATEUR WRITERS' EDITOR, THRILLING WONDER STORIES, 22 W. 48th St., New York City. Enclose a stamped, self-addressed envelope for the return of your manuscript if unavailable.

If your story is a fairly good one, we will be glad to publish it in T.W.S. Prize stories are purchased at the same rates paid our regular staff contributors.

JOIN THE LEAGUE

Have you joined our SCIENCE FICTION LEAGUE? It's an active national organization composed of the world's most enthusiastic followers of science fiction—and it fosters that intangible bond between all scientifiction readers. Just fill out the blank provided on this page.

To obtain a FREE certificate of membership, tear off the namestrip of the cover of this magazine, so that the date and the title of the magazine show, and send it to SCIENCE FICTION LEAGUE, 22 W. 48th St., New York City, N.Y., enclosing a stamped, self-addressed envelope.

And readers — write the editor of THRILLING WONDER STORIES a regular monthly letter. Tell us which stories you liked best, which are your favorite features and artists. Your suggestions and criticisms have made T.W.S. scientifiction's leading magazine. Help us maintain that leadership.—THE EDITOR.

OHIO FANTASY ASSOCIATION

Joseph M. Lewandowski, Jr., of 17 Riverview Road, Brecksville, Ohio, informs us that he is interested in organizing a Chapter in his community. All readers of THRILLING WONDER STORIES, STARTLING STORIES, and CAPTAIN FUTURE, are urged to communicate with Mr. Lewandowski, if they are interested in joining.

BROOKLYN CHAPTER

All Brooklyn, N. Y. fantasy followers are urged to contact Mr. John J. Ricci, 2095 Atlantic Ave., Brooklyn, N. Y., regarding formation of a SFL Chapter in his borough. Plans for an early meeting are under way.

HARTFORD, CONN., CHAPTER

Paul H. Spencer, Director of the Hartford Science Fiction League, asks that all fantasy followers residing in or near Hartford, Conn., contact him regarding membership in this chapter. Mr. Spencer may be reached at his home, 88 Ardmore Road, West Hartford, Conn. Phone—32-0055. Other members include Harold Hurwitz, Everett Fink, and Howard Miller.

BOSTON CHAPTER

All scientifiction fans residing in and around Boston, Mass., interested in forming a Chapter of the SFL are urged to get in touch with Mr. Philip W. Faden, 303 Fairmount Ave., Hyde Park, Mass.

More Club News—and a List of New Members—Next Month!

SCIENCE FICTION LEAGUE,
22 W. 48th St., New York, N. Y.

I wish to apply for membership in the SCIENCE FICTION LEAGUE. I pledge myself to abide by all rules and regulations.

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(Print Legibly)

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I am enclosing a stamped, self-addressed envelope and the name-strip from the cover of this magazine (tear off name-strip so that the name THRILLING WONDER STORIES and the date can be seen). You will send me my membership certificate and a list of rules promptly.

9-40
Use Small Denomination U. S. Stamps Only.

A TRIPLE SALUTE

By N. Willmorth

The cover scene of the July T.W.S. was well chosen. It depicts the climax of H. L. Gold's story in true form. In fact, it even agrees with what the author said of the moment—something rarely found and hardly to be expected from the artists. Give Brown a medal from me.

The "Voyage to Nowhere" was a rather nice story of poetic justice. More, please, of this above-average type. "Romance Across the Ages" had a new twist to the futureman-snatches-people idea. I like the lightly, humorous type of story well. The rest of the shorts were just short stories, though interesting. The novel was good. The duplicate idea is old, but here it is handled very well. Binder's novel in STARTLING STORIES is good; much better than the other one he wrote two years ago. Binder is one of my favorite authors, though his style disagrees with me at times. Wesso's illustration should have been on the cover.

The HALL OF FAME story was well chosen. May I urge you to use soon "The City of the Singing Flame" and its sequel, both by Clark Ashton Smith? These stories have been suggested many times and they live in my memory as being of the best.

CAPTAIN FUTURE is good! I didn't think Hamilton had it in him.

I enclose two-bits in stamps for you know what or if you don't it's for those eight little booklets.—Chelan, Washington.

GOES FOR GLAMOUR-GIRL GERRY

By T. K. Rogers

I am a very casual reader of magazines, and rarely become enough aroused to bother about writing an editor. I take my reading as it comes. If it is good—O.K. If it is not so good, well, I didn't expect too much anyhow. Generally, I am glad to say, I get good value for my money from Thrilling Publications.

But your editorial in THRILLING WONDER STORIES, asking for readers to root for their favorite authors, has roused me from my lethargy. I am definitely a Gerry Carlyle fan. She is one of the very few characters that stand out in my memory after much reading of science fiction.

By all means, more of Miss Carlyle. I worked for pictures myself some years ago and can appreciate anyone who wants to feud with them! (I assisted in set design.)

That man Manx is O.K., too. Likewise Anton York. But I will wager in the future THRILLING WONDER STORIES will be remembered more as the originator of that "glamma gal" and her unique feud.

I hope this letter has influence commensurate with the great effort expended in writing it. Only another great crisis will ever cause me to take up my pen again.—Montrose, Calif.

(Miss Gerry Carlyle sends word via the **Ark** that Tommy Strike is readying a new expedition. A full account of the female Frank Buck's new cargo of planetary monsters for the London Interplanetary Zoo is scheduled for an early issue of T.W.S. Her new adventure will be ready quicker than a Nine Planets Film can flop, she reports.—Ed.)

In this department we shall publish your opinions every month. After all, this is YOUR magazine, and it is edited for YOU. If a story in THRILLING WONDER STORIES fails to click with you, it is up to you to let us know about it. We welcome your letters whether they are complimentary or critical—or contain good old-fashioned brickbats! Write regularly! As many of your letters as possible will be printed herein. We cannot undertake to enter into private correspondence.

TIME ON HIS MIND

By Alan Saun

I will be as brief as I possibly can in discussing the June, 1940, issue of THRILLING WONDER STORIES and a few other important matters, as I have some grave news to tell you of at the end of this letter.

Without a doubt, "The Sun Maker," by Jack Williamson, was the best story. No little, trifling idea was involved in that novel. It was excellent. "Dr. Cyclops," by Henry Kuttner, was a close second. I was utterly enthralled and in terrific suspense while reading that great yarn. I always get that way when reading sub-atomic stories, my favorite type of science fiction story. Surprisingly, Orban's illustration for it was unusually good, as was Artist Brown's front cover depicting a scene from the outstanding novelet. Rest assured that I will make a point of seeing the movie.

Edmond Hamilton's "The Isle of Changing Life," and Nelson S. Bond's "Parallel in Time," both exceptionally fine stories excellently written, contained plots I had never before come across. I was immensely intrigued and fascinated by the stories. I will always be grateful to you, Mr. Editor, for having published stories by the latter author. That Earthling is going places—fast!

"Red Moon," by Frank Belknap Long, Jr., was another swell yarn, as were "The Lunar Pit," by Myer Krulfeld and "Knight Must Fall," by Kelvin Kent.

I was glad to see Marchioni represented in the latest issue of T.W.S. I always liked his drawings.

At someone else's suggestion, I, too, would like to read the autobiographies and see the fotos of some of science fiction's well known and active fans. We know all about most of the authors, so now inform us of essential particulars concerning some of the more prominent fans. You know, ones like Forrest J. Ackerman, Jack Darrow and so on. How's about it?

And now to discuss the grave news I mentioned in the first paragraph. Your April, 1939 issue contained a letter of mine—it was the first one—which told of my super-invention—a time-machine! This, you may recall, was borrowed by a colleague of mine, Professor M. T. Head, who, for some unexplainable reason, never returned.

Because of that I almost had a nervous breakdown, for I had planned to go years into the future to gather up copies of T.W.S. which haven't as yet been printed.

Well, you may be interested to learn that the professor did return several weeks ago. When I asked—perhaps I should use the word begged—him kindly to relate some of his adventures, he looked at me rather queerly, stuck out his tongue quite rudely, and, with head held high, stamped disgustedly out of my house, slamming the door heavily behind.

About a month ago he again disappeared, but this time without my beloved time-machine. Well, a few days ago when I went to

look at my super-invention, I was utterly horrified to discover that my time-machine —my beloved time-machine—was no longer in my laboratory. Ever since that time I have been frantic with intensified anxiety and worry.

I have hunted high and low, but can not locate it anywhere. Now, a comforting thought occurred to me just a while ago. It is simply this. Perhaps (don't ask me how), one of your readers knows where it is. I would certainly be appreciative if you would print this letter, so that anybody knowing its whereabouts can inform me as to just where my beloved time-machine is. Really, I'm quite worried!—Toronto, Ontario.

(Interested in the lowdown on your fellow fans? We'll publish the info—if enough of you ask for it. Let's have your letters, readers, with nominations for fandom's rogue's gallery.—Ed.)

THE SCIENCE PROBLEM

By S. C. Goldsmith

I have been reading science fiction for almost a year now, but I have been a silent reader, this being my first letter to any publication. You may expect to see me quite frequently from now on, as I intend to become a well-known fan. In my estimation THRILLING WONDER STORIES leads the field with the most well balanced magazine. The stories are usually above average, the science features are educational, the departments interesting, and the art very good.

Now for the science question. Some readers complain of too much science. I agree there should not be too much, but still not too little. If this happened science fiction stories would become merely adventure stories. Also, beware of stories that are better suited for other magazines such as detective, adventure and weird.

The authors of science fiction have to put a certain amount of science in their stories and therefore have to know something about it. Consequently the great majority of authors are well educated, and the stories take on a literary value usually lacking in other magazines.

CAPTAIN FUTURE is excellent; I have all three copies.

Cheerio, for now.—70 Leuty Avenue, Toronto, Ontario, Canada.

PILTDOWN PETE IN NEXT ISSUE!

By Jack Gordon

I just finished reading the June THRILLING WONDER STORIES and found it one of the best to date. The stories rank as follows: First, "Red Moon," excellently written story; second, "Dr. Cyclops"; third, "The Isle of Changing Life"; fourth, "Knight Must Fall"; fifth, "The Lunar Pit"; sixth, "Parallel in Time.'

"The Sun Maker," by Jack Williamson, was a very good story. It had everything—action, romance, pathos and suspense. It should be classed along with Stanley Weinbaum's immortal stories, such as "Valley of Dreams" and "A Martian Odyssey." Great work, Jack Williamson.

I am an ardent follower of Pete Manx and also the "Via" series. I would like to see Pete Manx visit the Stone Age and hobnob with the cave men. I think Jupiter would be a good locale for the next "Via" series.

The best illustrations in this issue were Wesso's for "Red Moon" and Murphy's for "The Sun Maker."—Minneapolis, Minnesota.

MEET BERGEY ON THIS MONTH'S COVER!

By Marvin Goldenberg

THRILLING WONDER STORIES has been on the market for a good number of years and has been the science fiction aristocrat during that time. However, I only started to read it about a year and a half ago. My friends told me about the good stories you published and so I decided to see if it was so. It was so! I found such stand-out stories

(Continued on page 128)

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The Story Behind the Story

SPACE pilots of the future will be made, not born! They'll be manufactured by institutions of American learning, just as the raw recruits that enter these academies today are evolved into skilled navigators, military experts, and efficient aviators.

The space pilot of tomorrow will have to be a wizard at mathematics, perfect in the art of astro-navigation. He'll have to know his physics, from Newton's first law of motion to beyond the Lorentz-Fitzgerald contraction. And he'll have to be a man besides, commanding the respect of his shipmates.

There's a long, grand tradition behind the United States' West Point. And there's even a finer destiny ahead of it in the centuries to come—the day when Earth's finest will patrol the interplanetary lanes to safeguard our planet from alien invasions, help foster inter-world commerce.

Arthur J. Burks catapults us thousands of years into the future and portrays a human document in his novel, WEST POINT OF TOMORROW, the story of the men whose world is bounded by the confines of a spaceship. It's a poignant story of courage and self-sacrifice, and we feel certain you'll be interested in the author's statement as to how the novel came to be written:

What is behind such stories as WEST POINT OF TOMORROW? The dreams of mankind, perhaps; the urge in all of us to reach out for new horizons. The answer to that urge, in writers, who try to foretell for their readers; who try, by means of reason and imagination—perhaps too much of the latter—to show people of today what the world will be like a thousand, five thousand, a million years hence. Who can possibly tell? Jules Verne made some good guesses, and his prophecies came true before he could possibly have imagined they would. For all we know, since for so many decades the narrowing frontiers of the world have caused pioneers to weep for more worlds to conquer, to look outward to the nearest planets, one of those planets may be reached even in my time. In these days of headlong progress one cannot be sure that tomorrow's paper will not say: "Professor Blank's rocket-ship is definitely known to have landed on Mars!"

Yes, it will come, but no man, for certain, can say just when. Therefore we speculate, try to guess, think that by basing theory on what we know of our individual logic we can draw word pictures of the far-distant, or perhaps not-so-far-distant, day when not only the skies will be filled with planes, as they are today, but the stratosphere, and the Heaviside layer, and beyond, into the infinite spaces of between-the-stars. There is one thing certain, when that day comes: it will be a long long time before the last frontier has fallen before the onslaughts of curious, adventurous pioneers! And I'd wager, right now, that the first great voyage will be one of aggression!

Anyway, somewhat nebulously, that's the story behind WEST POINT OF TOMORROW. It's just a dream, not necessarily my own, for the editor invariably has a hand in stories like this one, that I may live to see, or that may not come true for a million years. It is because we don't really know that tales of interplanetary travel and warfare grip the imaginations of writer, reader—and perhaps more advanced **Outlanders** than ourselves—say Martians, or Saturnians—who may be reading even this over our shoulders.

THE YEAR-LEAPER

PICK a century from one to twenty—and Pete Manx, year-leaper, will visit it for you! And if it's anything in the course of human events you want changed, the history-hopper will alter it for you.

Kelvin Kent's clarion call for suggested periods for future Manx tales is still sounding loudly. Trips to the Stone Age, ancient Greece, the days of Marco Polo, and others are still in the offing. The only ticket you need for passage on these anachronistic excursions is your copy of T.W.S.

Currently, Mr. Manx is busily engaged helping an obscure hack writer, Will Shakespeare, plot one-night stands, as you will notice in this month's offering, THE COMEDY OF ERAS. And, as Mr. Manx once told Sir Isaac Newton when he was hit by the Big Apple, "There ought to be a law!" Anyway, amid jive and jam, Kent goes into his dance:

COMEDY OF ERAS is the result of a reader's letter to the editor of T.W.S., suggesting that Pete Manx go back to Shakespearean and Elizabethan times. I'd like to take the opportunity to thank the readers for many similar helpful suggestions as to historical epochs in which Pete may eventually venture. I intend to utilize these periods in future tales about Mr. Manx, provided readers don't get tired of the series.

Aside from this, there was nothing particularly unusual about the writing of COMEDY OF ERAS, except that I got a headache trying to work while my daughter's friends were playing swing music downstairs. Swing may be on the way out, but it didn't sound like it that night. After a while I went down and pleaded for just a little quiet, but the only result was that I was asked to join in the dancing. I didn't, which was probably lucky, since swing dancing is no sport for a bald-headed old duffer who tips the scales at more than two hundred. But, at any rate, the affair gave me the idea of introducing rug-cutting into Shakespearean times—and after what Orson Welles and Vivien Leigh have done to the Bard of Avon, nobody can accuse me of lese-majesty.

Finally, I'd appreciatively welcome any more suggestions from the readers as to what periods they'd like to have Pete Manx visit. Just at present he's down at Saratoga watching the fillies, but I expect him back any day, probably broke and trying to borrow a couple of bucks from me. Unless, of course, he took his dice to Saratoga with him. . . .

(Continued on page 124)

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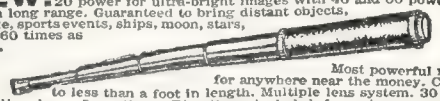

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THE STORY BEHIND THE STORY

(Continued from page 122)

SCIENCE AT THE FAIR

THE transmission of sound via radio is one of modern man's miracles. The broadcasting of light through the medium of television is another feather in our scientists' bonnets. Engineers are still working on the third link in this chain of wonders—the transmission of power.

What comes after that? The transmutation of matter—of organic and inorganic molecules! As Oscar J. Friend poses it in his featured short story in this issue, THE STOLEN SPECTRUM, man will some day be able to stand before a broadcasting unit in New York, to be "transmitted" to San Francisco, at the speed of light.

We're looking forward to the day when we can broadcast an issue of T.W.S. direct from the printer's to your library table. In the meanwhile, Oscar J. Friend broadcasts the lowdown on his yarn of science at the World's Fair directly from his typewriter to this page:

Living here in New York—and having come originally from the wide spaces of the Southwest (classifically referred to in Western fiction as God's Country) I have wondered many times at the way folks here blindly and continually try to violate a fundamental law of physics. I mean the one which states that two material bodies in the same plane of existence cannot occupy the same space at the same time. No wonder normal people call the subways cattle chutes. But to get on.

There are always some strays who buck the crowds, always some birds who want to come out of revolving doors and turn stiles when the stream of traffic is flowing in the opposite directions. Danged individualists! So I've speculated how nice it would be if we could suddenly change places with people on the other side of the subway turnstiles. It would save a lot of confusion, hustle and bustle, not to mention saving me many a nickel. And this seemed so logical, that I pursued the fancy further. Why not exchange places with people at the other end of the line, saving double carfare and a lot of time?

From this it was only a slight step to reversing carloads of people between different parts of the country, constituting the saving of gasoline, car depreciation, wear tire and boredom of driving, not to refer to the elimination of back seat chauffeuring. (The mind of a writer is really a mysterious and devious labyrinth.) And then I went to the World's Fair again.

By this time I was in high. The wonderful lights and colors of the Fair struck me again with the arresting force of their beauty. (As this is no plug for the Fair, I won't dwell on the fireworks, the water fountain, the colored lights and synchronized music.) But I did think how wonderful this all was—and visible to us through an exceedingly narrow band of visible light somewhere close to the middle of some sixty-odd octaves of electromagnetic frequencies. How terrible it must be to be blind. And on and on until, suddenly, the two uncorrelated ideas sort of melted, ran together, and jelled in the plot germ of a THRILLING WONDER STORIES story.

So I went home and sat down in front of the new Remington Noiseless (that you good folks bought for me) and proceeded to peel off that yarn about transmutation of matter and the invasion of the Red Derks from the infra-red plane of the fifth dimension. Before I knew it I had done six thousand words and I still hadn't got around to a lot of action in the Fair grounds under cover of the infra-red that I wanted to speculate about.

I didn't even have a comedy detective that

BEST FUN, FICTION AND FOTOS IN

I wanted to stick in. And the editor advised me that, although I was a nice guy and two people had written in to him that they liked to read my stuff, that the policy of THRILLING WONDER STORIES was to include other yarns by other authors in the same issue. So I had to break it off short. So don't ask me what became of the poor devils who were transported to the fifth dimension. I never had time to find out. I didn't even have time to make love to Kay Lowderdale. You see, a writer's life has a lot of disappointments.

A WORLD IN BONDAGE

THE future will see our modes of transportation changed; our sources of power will be different; our geography will be altered, encompassing the nine planets. Everything will change—except man! At least, that's the story the scientifiction writers are telling.

It's a lamentable plight that most writers envision for posterity. Golden science propels man upward. But human traits anchor man to the slime from which he arose. For, if we are to believe the science-seers, man will still war with his neighbors, still yearn for imperialistic conquest. And we can't blame the writers, in view of the present world state.

Anyway, if it's consolation, Frederic Arnold Kummer, Jr., has written THE TYRANT OF MARS to prove to us that Earth has no monopoly over dictatorships. Here's how the author arrived at the central idea for his tale:

The base of THE TYRANT OF MARS is the transformation of energy to matter. In our experiments with uranium . . . a series of experiments perfected since the writing of this story . . . we approach the conversion of matter into energy. Once this is completely solved, and sober scientists assure me that it's only a question of time, the reverse process, that of energy into matter can conceivably be worked out.

One of the points in the yarn that rather pleased me was that of an asteroid upon which the air had been trapped in the interior rather than on the outside as on earth. My theory was that since the outer crust of a world should cool first, the gases in the core should be trapped.

And since a tiny asteroid would cool through and through very quickly, these gases, including oxygen, would also cool, and the contraction of the outer crust might exert sufficient pressure to put them in a liquid state. Thus we might have a little world with atmosphere on the inside and its inhabitants drilling shafts to reach oxygen, just as we drill for natural gas on Earth. Anyhow, it leads to interesting possibilities.

THE TYRANT OF MARS was the second science story I ever wrote, completed in February, 1938. I'd very much like the readers' reactions to it, to find out whether I've improved or slipped since then. What's the verdict, fans?

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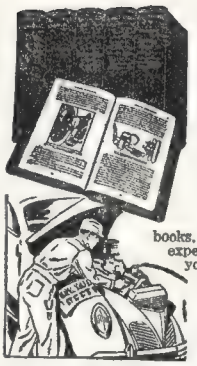

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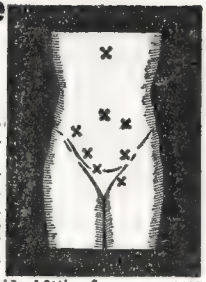

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THE STOLEN SPECTRUM

(Continued from page 117)

back exit of the Lowderdale exhibit to the Eastman building without mishap.

An hour later, a squad of soldiers from Camp Washington came stealthily through the blackness, goggled in grotesque fashion with photographical equipment through which they could see dimly. In a few minutes the spiteful *crack-crack* of Garand rifles began to punctuate the black and hellish turmoil. Twelve Derks there were, and twelve Derks were hunted down as they roved the Fair grounds on some mad mission of their own.

It didn't last long. No quarter was given. It was a grim business, this skirmish in the World of Tomorrow between the last word in armed soldiers of the Earth and the weird giants from the infra-red of the fifth dimension. An insane battleground of the infra-red, on the fringes of Hades.

John Barbour and Professor Lowderdale, leading six stalwart troopers, surrounded the huge platform in front of the Lowderdale exhibit. They closed in on the little cubicle behind the platform. Inside the little box they saw Kay Lowderdale crouching in terror on the floor, while at a little switchboard, staring blindly before him, his hands on the switches he could not see, sat Roy G. Biv.

The first trooper shot him through the chest before Barbour had a chance to call on the maniac to surrender. As Biv uttered a wailing cry and fell backward, his clutching hands pulled a pair of switches free. And suddenly there was blinding but blessed light in the world again.

It was minutes before people could see, but only seconds before John Barbour was clasping Kay Lowderdale in his arms.

Professor Lowderdale bent to examine the figure of the traitor to the world of the three normal dimensions. Roy G. Biv was dying, but he was not yet dead.

"So—you've won," he whispered. "Infra-red goggles! I see I underestimated your cleverness, Professor."

BEST FUN, FICTION AND FOTOS IN

"But why did you do it?" asked Lowderdale in genuine anguish. "Did that shock in the Schenectady laboratory unbalance your mind, Townley? You are Mark Townley, aren't you?"

"No," murmured the dying man. "Mark Townley is already dead. I am just—using his body. That explosion of the cyclotron was a lucky accident for the men of the fifth dimension. I got through on that freakish explosion and then, with your transmutator, prepared to bring my people through in exchange for Earthmen. Ours is a dying world—and we need a new one. We knew we would have to blot out the—spectrum you Earth beings know—or we would die. That's why I built a temporary machine—this one."

"But light didn't seem to hurt you," said Kay. "Why?"

"Because he was using a physical body of Earth, my dear," Barbour explained gently. "You see, Biv only came through psychically, not physically. That's why Townley seemed to lose his memory and power of speech. Biv had to learn how to use the vehicle he had usurped."

"Then—then he really isn't Mark Townley or Roy G. Biv, either?" puzzled the girl. "Who on Earth is he?"

"A man from the fifth dimension," said her father. "A red Derk without a name."

The dying entity in the mortal shell which had once belonged to a radio interviewer named Mark Townley looked up. A faint, cynical smile parted his lips.

"Yes, I have—a name," he murmured. "But you could neither spell nor pronounce it. So the name I took was symbolic of what I same to steal—your light spectrum. Remember me by that."

He quivered once or twice and then was dead. The last spiteful *crack-crack* of a Garand rifle in the distance marked the death of the final invader from the fifth dimension.

"Now what did he mean by that?" puzzled Kay.

"The stolen spectrum—Roy G. Biv," mused John Barbour aloud. "Red—Orange — Yellow—Green—Blue—Indigo—Violet. No, I don't think we will ever forget him!"

TO PEOPLE WHO WANT TO WRITE
But Can't Get Started

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THE READER SPEAKS

(Continued from page 121)

as "Gems of Life," "Beauty and the Beast," "The Lanson Screen," and many others.

One flaw remains; since I began to read THRILLING WONDER STORIES, Brown has been on every cover illustration! Now this must be remedied. I like Brown, but enough is enough! Why don't you try Wesso, Marchioni, or Schomburg on the cover? Brown should alternate between these artists every once in awhile.

Your companion magazine is peachy (referring to CAPTAIN FUTURE). There is a real s-f-mag!—1382 Goodfellow, St. Louis, Mo.

BATES BEST

By Harry Schmarje

Just finished the July issue of THRILLING WONDER STORIES. I thought it was a punk issue, all except the novel, "The Experiment of Dr. Sarconi." It was a wow! An improvement over the uninteresting "The Sun Maker," in the last issue. Please have more fine novels like "The Experiment of Dr. Sarconi."

As for the other stories: "Honeycombed Satellite," "Tangled Paths" and "The Machine Brain" bored me. Don't have any more boring stories. "Out of the Depths' was slightly better. "Voyage to Nowhere" was passable. "Romance Across the Ages" was the best of the "other stories."

I don't do SCIENCE QUIZ. IF is fine. SCIENTIFACTS, interesting. THE READER SPEAKS could be marvelously improved by adding my letter.—318 Stewart Rd., Muscatine, Iowa.

ANOTHER CARLYLE ROOTER

By Marilyn Myers

Being one of your youngest readers (aged 13), I hope the mistakes and grammatical errors in this letter do not irritate you. My main purpose of writing, besides telling you what a grand magazine you have, is in defense of Gerry Carlyle. Probably because I'm a feminine reader makes me prejudiced against a certain Mr. J. A.'s comments. In all science-fiction stories women have been made either the villain or some sissy who doesn't know a thing. So since Mr. J. A. has all other stories to be the hero, let the woman have a chance.

"The Experiment of Dr. Sarconi" was very good. Also "Tangled Paths."

I might close by saying your magazine is the best on the market.—69 Wellington Ave., San Anselmo, Calif.

BRAVOS FOR BROWN, BATES, BINDER AND BESTER

By Charles Hidley

The July cover is the best thing that Brown has done since "Life Eternal," with the possible exception of "Robot Al" in STARTLING STORIES. I still think, though, that the cover should be done by the artist that illustrates the cover-tale.

Bester takes second place with his novelet, "Voyage to Nowhere," and this position is quite an achievement for an author with only three shorts to his credit and a grand story, the best of the novels to date, to buck as competition. Murphy, I think, will improve as he gets used to stf. art. "The Machine Brain" had very good treatment and read well even under the yoke of an old, old theme. Binder should do more illustrations.

The Gold short was so like "Of Jovian Build" and Kuttner's recent giant yarn that it didn't appeal as well as it might. At least, though, there is the satisfaction of knowing that the giant's sacrifice was not in vain, as was the case in the other two.

"Romance Across the Ages" was very fine humor and just the proper length. The Wesso

BEST FUN, FICTION AND FOTOS IN

pic, poor. Miss Weinbaum's story was very good and should foretell many future tales by her gifted hand. I always like Marchioni. Next issue sounds good, but why entangle your contests in the story material? It makes me mad. The Gallun short was fair but left a huge "Why?" in my mind. It just didn't click, I guess, so it must be my "didn't like" story of the month. The pic was fair.

We come now to Harry Bates, a new author to me, but a good one. The only complaint to make about his **different** novel is that it was too short and should have been expanded to appear in STARTLING STORIES as the book-length. As with other stories of this type, it did not answer completely the many queries that would arise from such an unusual—even for science fiction—manuscript as this.

But as it was, it easily copped first place in not only the July issue but in the complete list of the novels presented in T.W.S. as well. The pics by Wesso were the best in the issue.

Instead of having three yarns illustrated by Wesso there should have been one by him and the other two by different artists, preferably Morey and Schomburg. You are coming nearer to my ideal of having each story illustrated by a different artist, making a variety of seven different styles an issue. The cover should depict the novel and should be executed by the same artist.—2541 Aqueduct Avenue, New York, N. Y.

ANSWERS TO SCIENCE QUIZ

(See Pages 30-31)

POSITIVE AND NEGATIVE

1. True.
2. True.
3. True.
4. False. Kepler's harmonic law explains that the squares of the periods are proportional to the cubes of the mean distances from the sun.
5. False.
6. True.
7. False.
8. True.
9. True.
10. False. Three observations are required.
11. True.
12. True.
13. False. Planets low down near the horizon also twinkle.
14. True.
15. False. They occur only in the southern half of Africa.
16. False. Four in number.
17. True.
18. True.
19. True.
20. True.

TAKE A LETTER

1. b
2. a
3. d
4. c
5. b
6. c
7. a
8. d
9. a
10. c

SPECTRUM ANALYSIS

1. slit. 2. band. 3. prism. 4. reverse. 5 grating. 6. sunlight. 7. Collimator. 8. dispersion. 9. refraction. 10. fraunhofer.

METER-OLOGY

3, 9, 11, 6, 12, 1, 4, 10, 5, 8, 7, 2.

THROUGH THE TELESCOPE

refractor, refracting, eyepiece, object-glass, increased, Newton, reflecting, bottom, prism, less, refracting, reflecting.

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Size Rim	Tires	Tubes
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30x4.50-20	2.35	1.05
30x4.50-21	2.40	1.15
28x4.75-19	2.45	1.25
29x4.75-20	2.50	1.25
29x5.00-19	2.85	1.25
30x5.00-20	2.85	1.75
5.25-17	2.90	1.35
28x5.25-18	2.90	1.35
29x5.25-19	2.95	1.35
30x5.25-20	2.95	1.35
31x5.25-21	2.95	1.35
5.50-17	2.35	1.40
28x5.50-18	3.35	1.40
29x5.50-19	3.35	1.45
6.00-17	3.40	1.40
30x6.00-18	3.40	1.40
31x6.00-19	3.40	1.45
32x6.00-20	3.45	1.55
33x6.00-21	3.65	1.55
32x6.50-20	3.75	1.75
6.00-16	3.75	1.45

REGULAR CORD TIRES

Size	Tires	Tubes	Size	Tires	Tubes
30x3½	$2.35	$0.95	32x4½	$3.45	$1.45
31x4	2.95	1.25	34x4½	3.45	1.45
32x4	2.95	1.25	30x5	3.65	1.65
33x4	2.95	1.25	33x5	3.75	1.75
34x4	3.25	1.35	35x5	3.95	1.75
32x4½	3.35	1.45			

HEAVY DUTY TRUCK TIRES
(High Pressure)

Size	Tires	Tubes	Size	Tires	Tubes
30x5	$4.25	$1.95	34x7	$10.95	$4.65
32x5	3.95	1.75	38x7	10.95	4.65
34x5	4.25	2.20	36x8	11.45	4.95
32x6	7.95	2.95	40x8	13.25	4.95
36x6	9.95	4.45			

TRUCK BALLOON TIRES

Size	Tires	Tubes	Size	Tires	Tubes
8.00-20	$3.75	$1.65	7.50-20	$6.95	$3.75
6.50-20	4.45	1.95	8.25-20	8.95	4.95
7.00-20	3.95	2.95	9.00-20	10.95	5.65
			9.75-20	13.95	6.45

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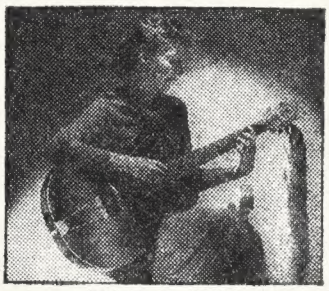
* *B. F., Bronx, N. Y.*



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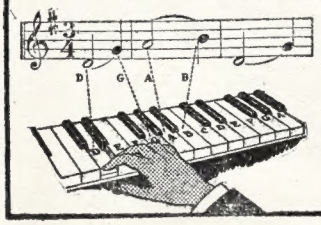

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